SEPTEMBER 1, 1956 Sec 8 PAGES 421 TO 272

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Offices: 7, ADAM STREET, ADELPHI, W.C.2
Telegrams: LANCET, RAND, LONDON Telephone: TEMPLE BAR 7228 and 7229

No. IX OF VOL. II, 1956 LONDON, SATURDAY, SEPTEMBER 1, 1956 Pp. 412—Price 1s. 6d.
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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Hereditary Pellagra-like Skin Rash with Temporary Cerebellar Ataxia, Constant Renal Amino-aciduria, and other Bizarre Biochemical Features — D. N. Baron, M.D., Prof. C. E. Dent, F.R.C.P., H. Harris, M.D., E. W. Hart, F.R.C.P., J. B. Jepson, D.PHIL. 421

Restriction of Fluid Intake after Partial Gastrectomy — A. W. Wilkinson, F.R.C.S.E. 428

The Use of Androgens in the Female — G. I. M. Swyer, M.R.C.P..... 433

Intraspinal Epidermoid Tumours — Prof. C. Choremis, M.D., and others 437

Anaphylactic Shock due to Oral Penicillin — R. C. Bell, F.R.C.S..... 439

The Safe Period — H. P. Dunn, F.R.C.S..... 441

Bone-marrow Depression in Tetanus — Patricia Wilson, F.F.A.R.C.S., F. I. R. Martin, M.B., P. M. Last, M.B..... 442

Renal Infarction with Hypertension — R A Hunter, M.R.C.P., W. A. McElmoyle, F.R.C.S.E. 443

Acquired Hæmochromatosis — C. D. R. Pengelly, M.R.C.P., Peter Jones, M.B..... 445

PRELIMINARY COMMUNICATION

Malignant Disease in Childhood and Diagnostic Irradiation in Utero — Alice Stewart, F.R.C.P., and others..... 447

NEW INVENTIONS

Opponens Splint for Thenar Paralysis in Poliomyelitis — G. P. Mitchell, F.R.C.S.E... 448

REVIEWS

Notices of Books..... 448

LEADING ARTICLES

X Rays and Leukæmia..... 449

Hepatitis Virus Grown ?..... 449

Cause of Death..... 450

ANNOTATIONS

Tuberculosis in Middle-aged Men 451

Insulin-neutralising Antibodies.. 452

The Lymphocyte: Friend or Foe of the Malignant Cell ?..... 452

The Anterior Tibial Syndrome.. 453

Oxytocin..... 453

Composting..... 454

The Hunters' House..... 454

SPECIAL ARTICLES

Psychotherapy in General Practice — Philip Hopkins, M.R.C.S.... 455

Changes in the National Diet.... 457

CONFERENCES AND CONGRESSES

World Federation for Mental Health..... 458

European League for Mental Hygiene..... 458

LETTERS TO THE EDITOR

Dismissal on Medical Grounds (Dr. J. W. Todd)..... 461

The Final Examination (Prof. Robert Platt, F.R.C.P.)..... 461

Prostatectomy at Hospital B (Mr. Paul Hickinbotham, F.R.C.S.; Mr. A. M. McMaster, F.R.C.S.E.) 461

Intestinal Obstruction Due to Food (Mr. A. J. H. Rains, F.R.C.S., Mr. Paul Dawson-Edwards, F.R.C.S., Mr. V. S. Brookes, F.R.C.S.; Mr. Seamus O'Donnell, F.R.C.S.; Mr. P. J. Ryan, F.R.C.S.: Dr. P. H. Minc) 462

The Unrecognisable Tablet (Dr. E. L. McQuitty; Dr. I. S. L. Loudon)..... 464

Use of Amiphenazole in Childbirth (Prof. F. H. Shaw, PH.D.; Dr. D. O'Connell)..... 464

English for Doctors (Dr. D. S. Nachshen; Mr. I. A. McGregor, F.R.C.S.)..... 465

Renal Tubular Activity (Dr. E. Dowdle, Dr W. P. U. Jackson, Dr. R. Hoffenberg)..... 465

Chlorpromazine and Amenorrhœa (Dr. W. Z. Polishuk, Dr. S. Fligelman)..... 465

Natriuretic Effect of Procaine (Prof. P. Bálint, A. C. Hajdu) 466

The Casualty Department (Mr. William Gissane, F.R.C.S.)..... 466

Reserpine in Acne Vulgaris (Dr. S. Bracha, Dr. J. Ph. Hes, Dr. M. Erdreich)..... 466

Hypothyroidism after Thyroidectomy (Dr. Deborah Doniach) 467

Vagotomy for Chronic Peptic Ulcer (Mr. Harold Burge, F.R.C.S.)..... 467

Fœtal Stethoscopes (Dr. A. Berry) 467

The Base Degrees by which we Rise (Dr. J. T. Duhig, Dr. G. M. Windrum)..... 467

Primary Aldosteronism (Dr. G. M. Jacobides)..... 467

Calorie Intake in Relation to Body-weight Changes (Prof. Alan Kekwick, F.R.C.P., Dr. G. L. S. Pawan)..... 468

Observer Error (Mr. P. D. Oldham, M.A.)..... 468

The Mortality of Anæsthesia (Dr. G. Dunderdale)..... 468

MEDICINE AND THE LAW

A Murder Conviction Quashed.. 459

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents... 460

PUBLIC HEALTH

Infectious Illness and School.... 469

Poliomyelitis..... 469

OBITUARY

Emanuel Mannie Lourie..... 469

David Sands Brough..... 470

Dr. R. Scot-Skirving 470

NOTES AND NEWS

Approved Names for Drugs..... 471

Appointments..... 470

Births, Marriages, and Deaths... 472

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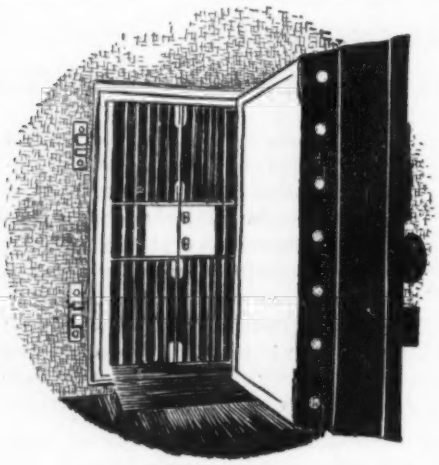

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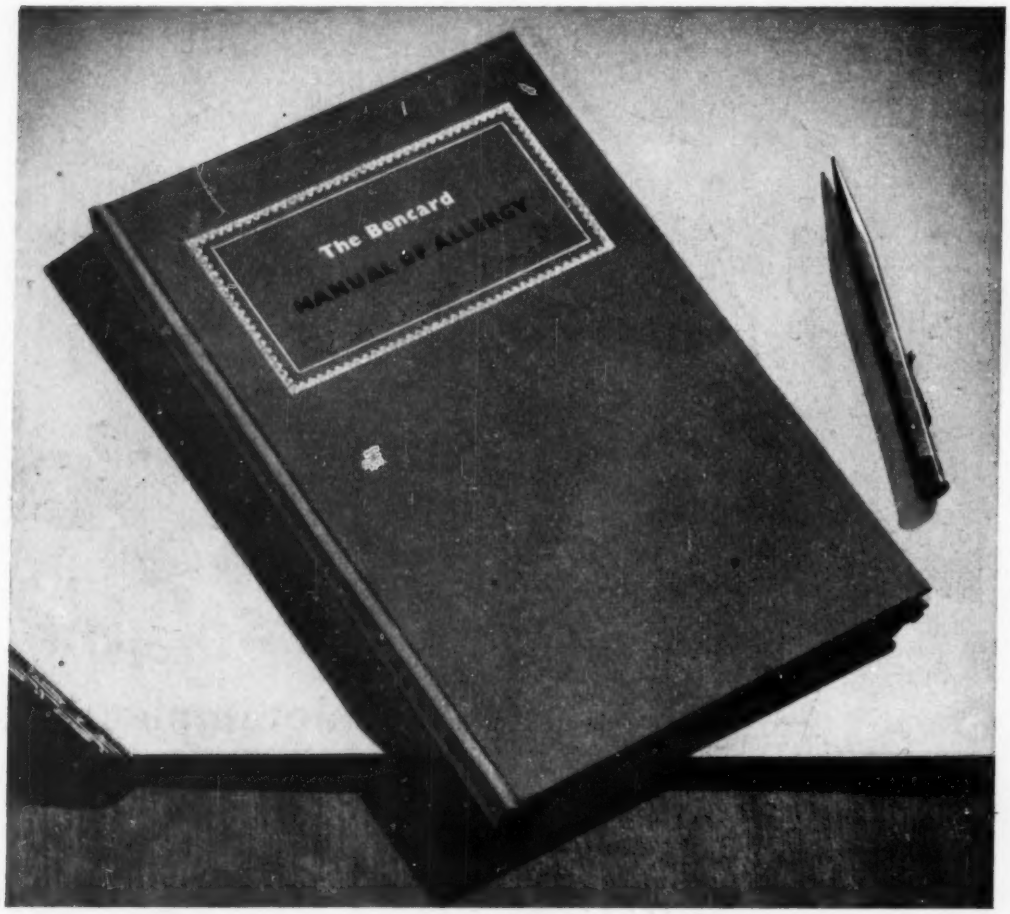

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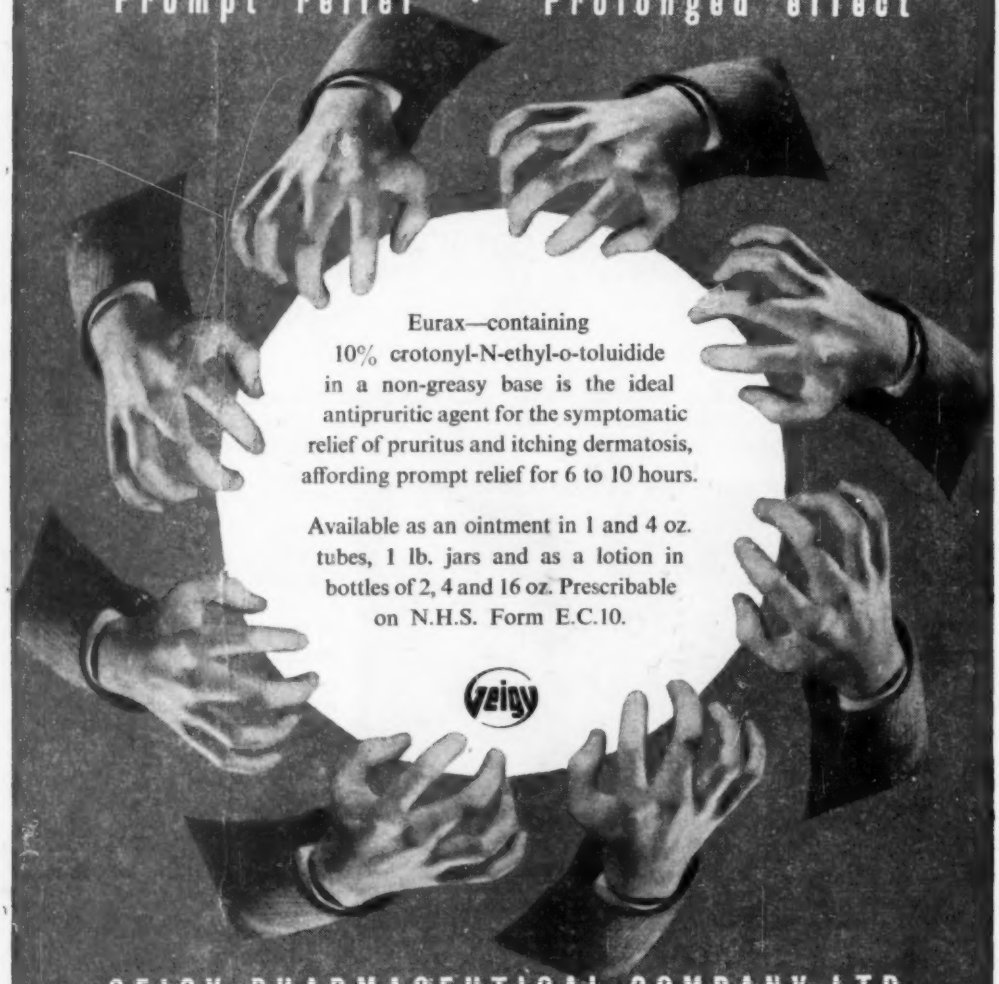

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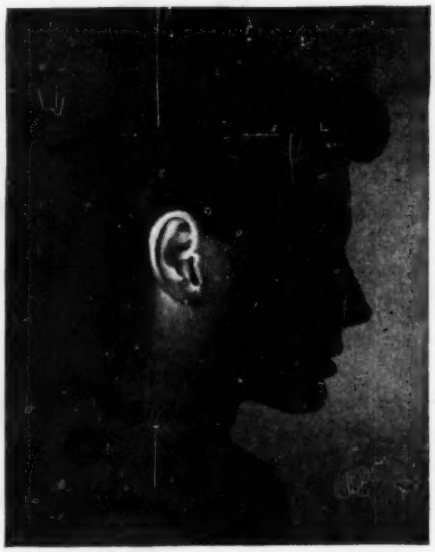

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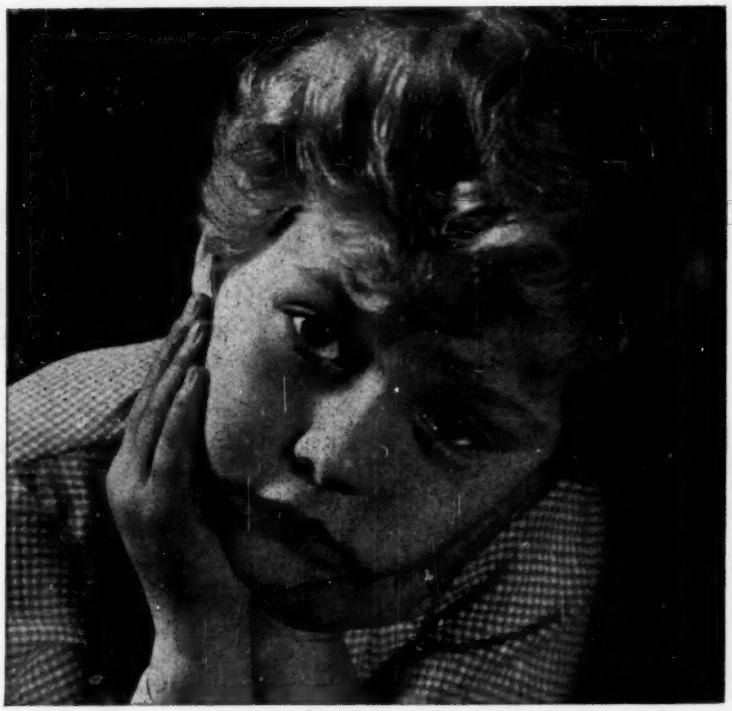
PACKS for Surgery Use: 10 c.c. vial — separate dropper included. (Basic N.H.S. price 2/8.) For Hospital Use: 2 oz. and 10 oz. bottles.



Favoured Treatment

THE little luxuries extended to ailing children do not often include an ingratiating medicine. There is a need for palatable and harmless forms of the drugs given to young patients. Aspirin, one of the commonest, is, for instance, one of the most unpleasant, and can be harmful to the delicate gastric mucosa.

On the other hand, most children will readily take aspirin in the form of *Junior Paynocil*. These tablets are really pleasant to take; they disperse instantly on the tongue without water, and minimise the risk of gastric irritation due to aspirin.

Junior Paynocil tablets each contain 2½ grains of aspirin and 1¼ grains of glycine. Besides speeding disintegration and eliminating the unpleasant aspirin flavour, glycine confers on each aspirin particle a lubricant, demulcent and protective barrier.

Junior PAYNOCIL

Packages

Cartons of 20 in sealed foil strips.

Tax free dispensing packs of 240.

Basic N.H.S. cost: 15/-.

C. L. BENCARD LTD., PARK ROYAL, LONDON N.W.10

NEW dramatic aid to psychotherapy

Pacatal

TRADE MARK

9-(1-methyl-3-piperidylmethyl) phenothiazine.

a powerful yet safe tranquillizing drug

Clinical trials in many countries have proved PACATAL to be highly effective in mental disturbances ranging from the psychoneuroses to the psychoses.

PACATAL reduces tension, makes the patient quieter, less confused—but still alert, objective, co-operative, amenable to psychotherapy.

NOW available in ampoules for parenteral administration.

In anaesthetic medication, PACATAL reduces tension and anxiety in the pre-operative period, provides smooth and safer induction and potentiates anaesthetics. Post-operatively PACATAL aids rapid recovery and reduces nausea and vomiting.

PACATAL can be administered with complete confidence, being of low toxicity and uniquely free from troublesome side-effects.
It is rapidly absorbed and quickly eliminated, thus ensuring against cumulative dangers.

Pacatal **is available in tablets for oral administration and ampoules for parenteral use.**

Tablets 25 mg. in bottles of 50 and 500.
Ampoules 2 ml., 25 mg./ml. in boxes of 10 and 50.

WILLIAM R. WARNER & CO. LTD., POWER ROAD, LONDON, W.4.

How severe a gastric irritant is aspirin?

FURTHER RESEARCH has now been done into the irritant effects of aspirin upon the gastric mucosa. A detailed report on this work appears under the heading "Aspirin and Ulcer" in the B.M.J., July 2nd, 1955.

The summary of the discussion appended to this report is as follows:

"Aspirin is a serious gastric irritant, particularly in peptic ulcer patients."

Here is a further extract from the report:— "In conclusion it is suggested that aspirin should never be given to patients with peptic ulceration, or indeed to those who have any gastric intolerance to it, however mild. Such an instruction should be given a prominent place in peptic ulcer advice charts, usually in place of much that could be safely left out. Some of these patients took aspirin on a full stomach only in powder form, with serious results, and, although this method almost certainly mitigates its irritant effects, it does not guarantee immunity. Calcium aspirin does not have this irritant action unless it has deteriorated through standing, and it can be used with impunity, especially if prescribed in soluble form. This simple measure would, in our opinion, cut down significantly, the incidence of haematemesis and exacerbations of ulcer symptoms."

SOLPRIN provides calcium aspirin in pure and stable form.

CODIS is a compound tablet that provides codeine and phenacetin and calcium aspirin, in place of the ordinary aspirin in Tab. Codein. Co. B.P.

Neither SOLPRIN nor CODIS is advertised to the public.

RECKITT AND COLMAN LTD., HULL & LONDON (PHARMACEUTICAL DEPT. HULL)

For prompt and effective control of both inflammation and infection

HYDROMYCIN

Boots Pure Drug Company Limited are pleased to announce the availability of Hydromycin Ointment. Hydromycin combines the anti-inflammatory properties of hydrocortisone acetate with the wide spectrum anti-bacterial activity of neomycin sulphate.

OINTMENT

(Hydrocortisone acetate 1% and neomycin sulphate 0.5%)

Available in tubes of 5G. ... Basic N.H.S. price 6/2d.
15G. ... „ „ „ 15/7d.

EAR/EYE OINTMENT

(Hydrocortisone acetate 1.5% and neomycin sulphate 0.5%)

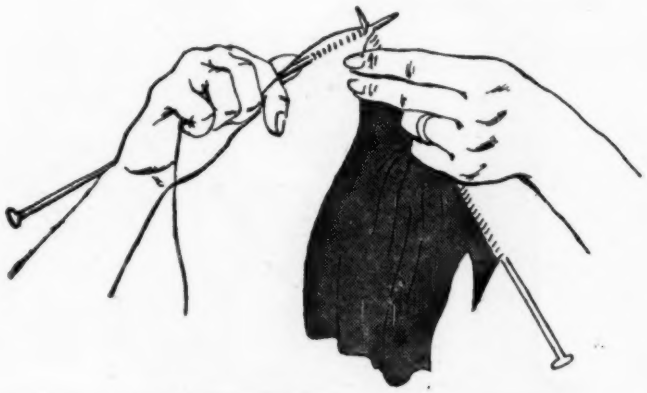
Available in tubes of 3G. ... Basic N.H.S. price 8/4½d.

Detailed literature will be gladly sent on request.

BOOTS PURE DRUG COMPANY LIMITED, NOTTINGHAM, ENGLAND

Boots

ANTE-NATAL



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capsules containing readily assimilable iron and the natural Vitamins of the B complex give all the additional haematic factors necessary during pregnancy and lactation to maintain maximum well being for mother and child.

Literature and samples on request

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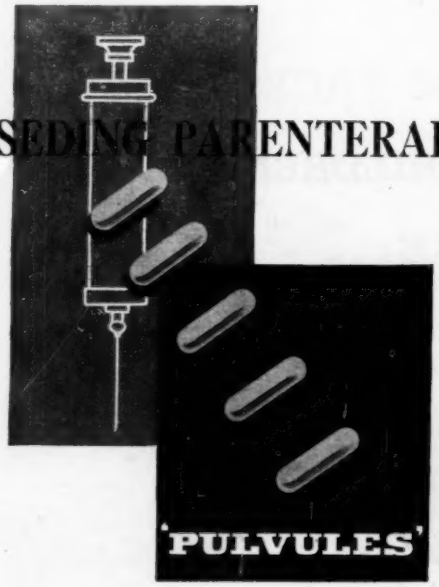
Methyl Nicotinate 1.0%
Glycol Salicylate 10.0%
Histamine Dihydrochloride 0.1%
Capsicin 0.1%
Excipient q.s.

Cremalgin has always meant Economy without detriment to the treatment of N.H.S. patients.

Indications: **Rheumatism, Fibrositis, Sciatica, Lumbago, Muscular Pain, and associated conditions.**

Packed in 1 oz. dispensing tubes at 21/- per doz. plus 30% p.t. and in 16 oz. dispensing jars at 19/6d. per unit plus 30% p.t.

WEST PHARMACEUTICAL CO. LTD. WOOD LANE W.12. Tel: SHE 6262



SUPERSEDING PARENTERAL THERAPY

PENICILLIN-V Lilly

THE *effective* ORAL PENICILLIN

Reports prove that Penicillin-V will give clinical results comparable with parenteral penicillin. The oral route is time-saving and painless. Blood levels are higher and more prolonged than with other oral penicillins. Penicillin-V is unique in that it is unaffected by the action of gastric acid. Whenever penicillin is indicated, Penicillin-V is the product of choice.

The average dose is one 125 mg. capsule four times daily increased in severe infections.

'Pulvules' Penicillin-V Lilly each contains 125 mg. (200,000 units). Suspension Penicillin-V Lilly Paediatric, in bottles to make 60 cc. contains 62.5 mg. (100,000 units) per large teaspoonful.

Lilly TRADE MARK

ELI LILLY & COMPANY LIMITED

BASINGSTOKE HANTS

NO LONG FACES WHEN CHILDREN TAKE . . .

Maw's

Tancolin (Regd.)

CHILDREN'S COUGH LINCTUS

Active Ingredients	%W/V
Theophylline ...	0.33
Ethylmorphine Hydrochloride	0.025
Sodium Antimonyl Tartrate	0.00125
Ascorbic Acid ...	0.25
Glycerin ...	20.8
Sodium Citrate ...	2.0
Citric Acid ...	1.0

Tangerine Flavoured to provide an immediately acceptable and effective treatment, appealing instantly to even the most unco-operative child patient. Tancolin combines a pleasant vehicle with a rational formulation — specifically for children.

TANCOLIN has been designed to give a twofold anti-spasmodic and sedative action. The inclusion of a demulcent, a reflex expectorant and added Vitamin 'C' content are valuable adjuncts to this primary function.

TANCOLIN is indicated for treatment of the distressing and irritating cough associated with the common cold, Bronchospasm Bronchitis and Inflammatory and Catarrhal affections of the Respiratory Tract.

TANCOLIN is freely prescribable on E.C.10 (Cat. 3/4) and achieves therapeutic efficiency with economy.

S Maw Son and Sons Limited · Barnet · England

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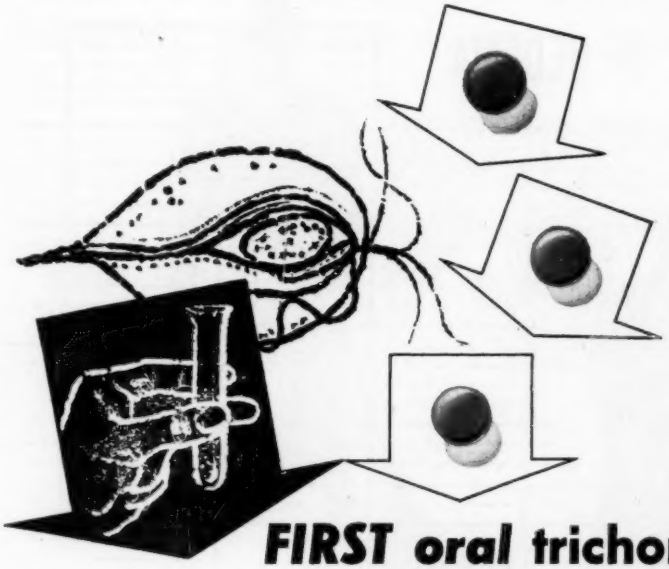


FIRST oral trichomonacide

TRITHEON*

BRAND OF AMINITROZOLE **TABLETS** TRADE MARK

for male and female

Because of their systemic action, **TRITHEON** tablets reach resistant trichomonads in their hiding places throughout the genito-urinary tract. Unlike local trichomonacides, **TRITHEON** tablets eradicate the organism in male and female as proved by *negative culture.*

Clinical investigation has demonstrated that **TRITHEON** tablets administered orally eradicate trichomonads for **culture-proved cure** of more than 70 per cent of female patients whose husbands are treated simultaneously with **TRITHEON** tablets. Even when only the wife is treated, cures are effected in approximately one-third of the patients.

Dosage: One tablet three times daily for 10 days

Available: Bottles of 30, 180 and 1000 tablets; each tablet contains 100mg 2-acetylamino-5-nitrothiazole

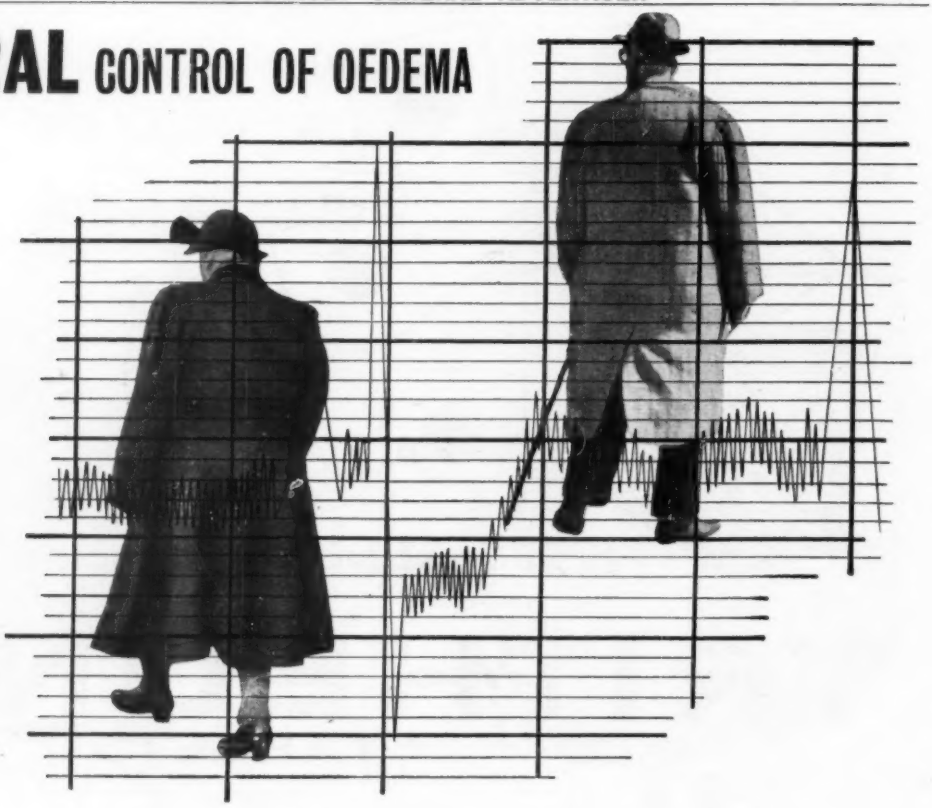
LITERATURE ON REQUEST

Ortho

Ortho Pharmaceutical Limited • High Wycombe • England

* **TRITHEON** is the original brand of 2-acetylamino-5-nitrothiazole tablets developed in the Ortho Research Foundation for the oral treatment of trichomoniasis

ORAL CONTROL OF OEDEMA



Oedema in cardiac patients can now be successfully controlled by Mercloran, a mercurial diuretic which is effective when given orally. Two to three Mercloran Emplets daily maintain a smooth oedema-free state and eliminate the see-saw effect of preparations given intermittently. Mercloran in most cases completely eliminates the need for injection. However, in the acute case where it is deemed necessary to initiate treatment parenterally, the chemically related compound, Mercardan, is available.

MERCLORAN

(CHLORMERODRIN N.N.R.)

EMPLETS: (enteric coated tablets)
In bottles of 25 and 250

AND MERCARDAN FOR PARENTERAL USE

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Meeting all your needs for CORTISONE

SYSTEMIC

Cortelan Intramuscular Injection 25 mg./cc.

Cortelan Tablets 5 mg. and 25 mg. (scored)

Delta-Cortelan Tablets 5 mg. *(available only to hospitals at present)*

Ef-Cortelan Sterile Solution 100 mg./20 cc.

LOCAL

Ef-Cortelan Intra-Articular Injection 25 mg./cc.

Ef-Cortelan Nasal Spray 0.02%

Ef-Cortelan Skin Lotion ½ & 1%

Ef-Cortelan Skin Ointment No.1 (non-greasy) ½, 1 and 2½%

Ef-Cortelan Skin Ointment No.2 (greasy) ½, 1 and 2½%

OPHTHALMIC

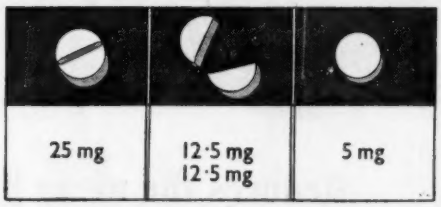
Cortelan Eye Drops 1%

Cortelan Eye Ointment 1%

Ef-Cortelan Eye Drops 1%

Ef-Cortelan Eye Ointment 2½%

3 OUTSTANDING PRODUCTS FROM AN ALL-EMBRACING RANGE



Precisely what is needed for the treatment of Rheumatoid Arthritis

New relief from allergic catarrh

A little goes a long way

CORTELAN *Trade Mark* (cortisone Glaxo) | **EF-CORTELAN** *Trade Mark* (hydrocortisone Glaxo) | **DELTA-CORTELAN** *Trade Mark* (prednisone Glaxo)

GLAXO LABORATORIES LTD · GREENFORD · MIDDLESEX BYRon 3434

GLAXO

25

ADRENOXYL

Reduces the mean bleeding-time

Adrenoxyl reduces the mean bleeding-time by decreasing the permeability and increasing the contractility and resistance of the capillary wall.

A dry field at operation

Adrenoxyl has been successful in diminishing capillary bleeding in a wide range of surgical operations. It has proved particularly useful in ear, nose and throat, ophthalmic and plastic surgery. In plastic surgery of the face it has been reported that, post-operatively, there is less swelling and bruising when Adrenoxyl has been used.

No side effects

Adrenoxyl does not have any side effects or contraindications. It does not affect blood coagulation, blood pressure or pulse rate and does not possess any sympathomimetic properties.

In medical conditions

Adrenoxyl has been used with success in those medical conditions associated with capillary fragility.

In the British Medical Journal (April 21st, 1956) a correspondent confirmed the value of Adrenoxyl in providing a dry field for the surgeon and in shortening the duration of the operation.

Packs

Ampoules: Boxes of 6 and boxes of 50.
Each ampoule contains 0.75 mg. of adrenochrome monosemicarbazone dihydrate.

Tablets: Tubes of 25 and bottles of 500.
Each tablet contains 2.5 mg. of adrenochrome monosemicarbazone dihydrate.

The best results are obtained when both tablets and ampoules are used.

HORLICKS LIMITED

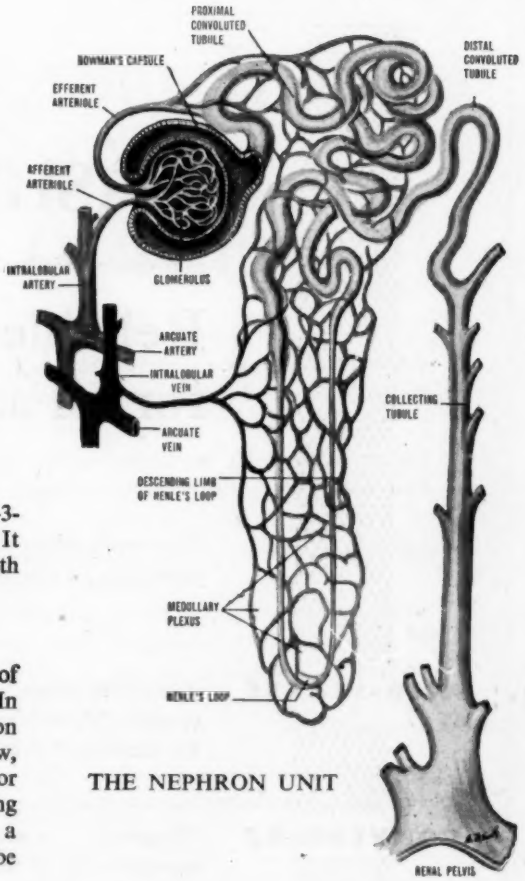
Pharmaceutical Division Slough Bucks

Literature and samples are available on request to the Medical Information Dept.

A PRODUCT OF SEARLE RESEARCH

MICTINE*

Effective, Non-Mercurial Oral Diuretic



THE NEPHRON UNIT

STRUCTURE

"Mictine," brand of aminometradine, is 1-allyl-3-ethyl-6-aminotetrahydropyrimidinedione. It avoids the undesirable side-effects associated with mercurial, xanthine or sulphonamide agents.

ACTION AND EFFECTIVENESS

"Mictine" is believed to act by inhibition of sodium ion absorption in the renal tubule. In therapeutic dosage it has not caused any effect on glomerular filtration rate, renal plasma flow, cardiac output, heart rate or blood pressure, nor any alteration in the blood or blood-forming tissues or in renal or hepatic function. In a group of unselected patients 70 per cent. may be expected to respond to "Mictine".

TOLERANCE

"Mictine" is not toxic at therapeutic dosages. On the other hand, side-effects do occur such as headache and gastro-intestinal symptoms. These are reduced to a minimum if an interrupted dosage scheme is adopted.

ADMINISTRATION

"Mictine" is indicated in the maintenance of an oedema-free state in any patient requiring diuretic therapy and the effecting of initial diuresis in all patients but those with severe congestive failure. For these purposes the dosage is one to four tablets daily in divided doses during meals on alternative days or on three successive days followed by four days without therapy. "Mictine" is not intended to produce initial diuresis in more severe congestive failure; however, "Mictine" may be given when other diuretics are contra-indicated, or if tolerance to them has developed.

Available in bottles of 25, 100 and 500 tablets each containing 200 mg. aminometradine.

Full literature is available to the medical profession on request. G. D. Searle & Co. Ltd., 83, Crawford Street, London, W.1.

**Registered Trade Mark*

SEARLE

MI : P86

Virtually a new antibiotic

'Distaquaine' V

trade mark brand

phenoxymethylpenicillin · penicillin V

Reliable ORAL Penicillin for all ages

"On present evidence it seems clear that penicillin V is more potent, dose for dose, than other oral preparations."

ANNOTATION, *Brit. med. J.*, I. 282. 1956

ACID-STABLE

'Distaquaine' V tablets, containing a new acid-stable penicillin (penicillin V), combine the convenience of oral penicillin with the reliability of treatment by injection.

CONVENIENT

The dosage in an adult for the treatment of an infection of average severity is six tablets daily at four-hourly intervals. Smaller doses of the scored tablets may be given (e.g., in jam) to children.

INEXPENSIVE

A bottle of 30 tablets (sufficient for five days' treatment in an adult) costs 6s. 10d. That is, the basic cost to the N.H.S. is less than 1s. 5d. per day.

PACKS: 60 mg. tablets.* Bottles of 30, 200 and 1,000.

*60 mg. equivalent to 100,000 units of penicillin G.

THE DISTILLERS COMPANY *(Biochemicals)* LIMITED

FLEMING ROAD, SPEKE, LIVERPOOL 19. *Tel:* HUNTS CROSS 1271

Export enquiries: DEVONSHIRE HOUSE, PICCADILLY, LONDON, W.1. *Tel:* MAYFAIR 8867

PPH 3/56

Intramuscular Iron
and the
Anaemias of Infancy

The value of Imferon in Nutritional Anaemia of Infancy and in the prophylaxis and treatment of Anaemia of Prematurity has recently been convincingly demonstrated.

* "There was obvious rapid clinical improvement in all cases as shown by the return of appetite, change of disposition, improvement in colour, and gain in weight."

* "The daily rise in haemoglobin during the first two weeks after treatment was almost 1.5%." *Brit. Med. J.* 1955 *2*, 700.

Imferon is the most practical and effective means of administering iron to infants who do not make progress on oral preparations. The increase in haemoglobin concentration is about 20% in two weeks—more than can be achieved with any form of oral therapy.

THE INDICATIONS FOR IMFERON IN INFANCY ARE:

1. Nutritional anaemia in infants who do not make progress on oral iron.
2. Nutritional anaemia in infants whose home conditions are poor and who would otherwise have to be admitted to hospital.
3. The prophylaxis and treatment of anaemia of prematurity.
4. As an alternative in some cases to blood transfusion.

FURTHER INFORMATION IS AVAILABLE ON REQUEST.

Imferon is issued in ampoules of 2 ml. (100 mg. Fe) in boxes of 10 and 100.

Imferon REGD.
IRON DEXTRAN COMPLEX

A PRODUCT OF BENGER LABORATORIES

BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE

September Nineteen Fifty-Six

presenting

PUROVERINE

for the treatment of

PRE-ECLAMPSIA and ECLAMPSIA

Prolonging the pregnancy with safety to both mother and foetus is the problem in severe pre-eclampsia.

Puroverine protects the mother from immediate danger by counteracting arteriolar vasoconstriction—the most damaging factor in pre-eclampsia and eclampsia—and lowering the blood pressure safely and steadily.

Pre-eclampsia is associated with a significant reduction in effective uterine blood flow. By producing a twofold or threefold increase in uterine blood flow, Puroverine improves uterine and placental nutrition—and hence the prognosis for the foetus.

J. Obstet. Gynaec., Brit. Emp.
1955, 62, 696

PUROVERINE (protoveratrines A and B in the constant ratio of 2:1) is now available for the treatment of pre-eclampsia and eclampsia. Detailed information is being forwarded to obstetricians and obstetric units throughout the United Kingdom. Professional samples, additional material and advice will gladly be given upon request.

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SANDOZ PRODUCTS LTD.

134, *Wigmore Street* *London, W.1*

Taste, tolerance and efficiency in

Iron Therapy

Difficulty in treating an iron-deficiency anaemia is more often due to "consumer-resistance" to unpleasant remedies than to any refractoriness of the anaemia itself.

Ferlucon Elixir, a highly stable solution of Ferrous Gluconate, has a high utilization rate, and is both palatable and well-tolerated.

It is suitable for the treatment of all iron-deficiency anaemias—especially those of childhood and pregnancy, when palatability and absence of unpleasant alimentary disturbances are of particular importance.

Each teaspoonful (3.5 ml.) contains 0.3 g. Ferrous Gluconate-Evans.

FERLUCON ELIXIR

Presentation: Bottles of 4 fl. oz. (114 ml.) and 2 litres.

Ferlucon Tablets containing 0.3 g. Ferrous Gluconate are also available

EVANS MEDICAL SUPPLIES LIMITED

LIVERPOOL LONDON NEWCASTLE SWANSEA

London Office: Ruislip, Middlesex (Ruislip 3333)

The KEYSTONE of anti-hypertensive Therapy

'RAUWILOID'

"This was by far the most effective and useful orally administered agent for reducing blood-pressure which we have yet used. In our opinion this substance is fully worthy of a trial in every case of essential hypertension in which treatment is thought to be necessary. The severe cases, which always need treatment, are as likely to respond as the mild".

See *British Medical Journal* (1955) 1 : 809

'Rauwiloid' is a selected fraction of the alkaloid hydrochlorides of Rauwolfia serpentina, and combines the hypotensive activity of reserpine and rescinnamine with that of the other desirable alkaloids of the crude drug. 'Rauwiloid' should be regarded as the basic treatment for all grades of hypertension.

If sufficient lowering of blood-pressure is not apparent after 2/3 weeks use, 'Rauwiloid + Veriloid' and 'Rauwiloid' + Hexamethonium, tried in that order, are suggested as suitable agents. In each case 'Rauwiloid' reduces the side-effects of the potent antihypertensive, and in both combinations dosage is regulated solely by the patient's requirements for the more potent agent.

Dosage of 'Rauwiloid' is simple — two tablets at night are usually sufficient, and this dosage can be reduced to one for maintenance therapy.

The daily cost to the National Health Service on full dosage is 5d.

RIKER

'RAUWILOID' and 'VERILOID' are Registered Trade Marks

Regd. users: **RIKER LABORATORIES LIMITED**

LOUGHBOROUGH • LEICS

In anxiety states . . . . . three-fold effective therapy

Anxine Tablets provide the complete symptomatic treatment of anxiety states by improving mood and increasing confidence, by inducing gentle sedation and allaying anxiety, and by securing the optimal degree of muscular relaxation.

Although each of the three components of Anxine Tablets, dexamphetamine sulphate, cyclobarbitone and mephenesin, makes an important contribution to the amelioration of the symptoms of anxiety states, none is adequate alone. It is only when they are combined, in the form of Anxine Tablets, that maximum control of symptoms is achieved.

Anxine Tablets are indicated in the treatment of anxiety states, psychoneuroses and psychosomatic disorders. Anxine will produce rapid improvement in cases where mental or emotional tension is an important factor, in depression and neurasthenia, and in those patients suffering from the many ill-defined anxieties and fears which can so profoundly and adversely affect general health.

ANXINE

Each tablet contains :—

DEXAMPHETAMINE SULPHATE	2·5 mg.
CYCLOBARBITONE	35 mg.
MEPHENESIN	120 mg.

C56/160/161H

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'Largactil'

trade mark brand

CHLORPROMAZINE HYDROCHLORIDE

IS INDICATED IN PAEDIATRICS FOR

1 **CONTROL OF NAUSEA AND VOMITING** including cyclical vomiting and that due to respiratory infections, poliomyelitis, acute otitis media, gastro-enteritis and radiation therapy.

2 **CONTROL OF HYPERACTIVITY AND BEHAVIOUR DISORDERS** particularly in the hostile, aggressive or agitated patient, in whom 'Largactil' produces tranquillity without depression. The child becomes accessible to psychotherapeutic measures and responsive to normal guidance.

3 **CONTROL OF PAIN AND DISTRESS** before and after surgical procedures, in burns and fractures. 'Largactil' not only enhances the actions of analgesics, narcotics and sedatives but also relieves the apprehension and tension associated with pain.

The ever widening recognition of the value of 'Largactil' has resulted in steadily increasing production, enabling us to make still further reductions in the prices of all preparations. Substantially reduced prices have been in operation since 18th August, 1956.

*

PRESENTATIONS

Tablets of 10, 25, and 100 mgm.
1 and 2·5 per cent solutions for injection.
Suppositories each containing 100 mgm. base
Syrup, each 3·6 c.c. (approx. 1 teaspoonful) containing 25 mgm. chlorpromazine hydrochloride

Detailed information is available on request

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MAY & BAKER LTD

An M&B brand Medical Product

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DISTRIBUTORS: PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD. · DAGENHAM · ESSEX

Children like it... worms don't

One week's treatment with 'Antepar' Elixir is usually sufficient to eradicate *threadworms*. A single dose clears *roundworms* from the gut. Effective without fasting, purging or supporting measures, 'Antepar' acts by paralysing the worms—they are then expelled by normal peristalsis.

'Antepar', the original elixir of piperazine, is well tolerated by patients of all ages. Its pleasant taste is popular with children. Containing piperazine citrate equivalent to 500 mgm. of piperazine in each fluid drachm, 'Antepar' is supplied in bottles of 4 fl. oz. and 20 fl. oz.

'ANTEPAR' ELIXIR

BURROUGHS WELLCOME & CO. (THE WELLCOME FOUNDATION LTD.) LONDON

Associated Houses:
AUCKLAND BOMBAY BUENOS AIRES CAIRO DUBLIN JOHANNESBURG KARACHI MONTREAL NAIROBI NEW YORK RIO DE JANEIRO ROME SYDNEY

for threadworm and roundworm infestation

'ENTACYL'

TRADE MARK

SUSPENSION containing 600 mg. piperazine adipate in each teaspoonful.

TABLETS each containing 300 mg. piperazine adipate.

AGE	DOSAGE		Requirement for 7-day course of treatment	
	TABLETS	SUSPENSION	TABLETS	SUSPENSION
Under 2 yrs.	2 daily	1 teaspoonful daily	14	1 fl. oz.
2 yrs. to 6 yrs.	4 daily	2 teaspoonfuls daily	28	2 fl. oz.
6 yrs. and over	6 daily	3 teaspoonfuls daily	42	3 fl. oz.

This daily dosage should be administered for seven days. It may be necessary to repeat this treatment after an interval of seven days in threadworm infestation and after an interval of three weeks in roundworm infestation.

BASIC N.H.S. PRICES

TABLETS Bottles of 25 at 3/- and 100 at 10/-

SUSPENSION Bottle of 225 ml. (8 fl. oz.) approx. at 12/-

BRITISH DRUG HOUSES LTD. (Medical Department) LONDON N.1

HEREDITARY PELLAGRA-LIKE SKIN RASH WITH TEMPORARY CEREBELLAR ATAXIA. CONSTANT RENAL AMINO-ACIDURIA. AND OTHER BIZARRE BIOCHEMICAL FEATURES

D. N. BARON
M.D. Lond.
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C. E. DENT †
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H. HARRIS
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OF THE GALTON LABORATORY, UNIVERSITY COLLEGE, LONDON‡

E. W. HART
M.D. Camb., F.R.C.P.
OF THE MIDDLESEX HOSPITAL, LONDON

J. B. JEPSON
M.A. Camb., B.Sc., D.Phil. Oxfd
OF THE MIDDLESEX HOSPITAL MEDICAL SCHOOL, LONDON

IN recent years many new clinical syndromes have been described in association with gross disorders of metabolism. The discovery of such a biochemical association is clearly of value when attempts are made to find and understand the underlying cause of the disease with a view to corrective therapy. The biochemical disorder is usually of value too in helping to diagnose the disease since it may be easy to demonstrate and may be more constant and characteristic than are any of the clinical features. This latter point especially applies to hereditary diseases, where the action of a gene may show itself by a constant gross biochemical abnormality even when the clinical signs, with their more clumsy means of detection and measurement, remain ambiguous and fluctuate in intensity.

We describe here our preliminary studies of a new syndrome of this type. These studies began in 1951, when a boy was admitted to the Middlesex Hospital under one of us (E. W. H.) apparently suffering from severe pellagra associated with a neurological disorder. His urine contained a consistently large amount of amino-acids. This led to many further biochemical investigations and it soon became apparent that we were dealing with a bizarre and hitherto undescribed syndrome. Studies of the boy's relations revealed similar biochemical features in three of his siblings, of whom one had been admitted several years previously to the Middlesex Hospital with a similar pellagra-like syndrome.

The clinical follow-up of this interesting family has continued till now. Meanwhile, with the kind coöperation of many other workers, extensive investigations into special aspects of its numerous biochemical features have been made, and scanty references to this have already appeared in various publications (Dent 1952, Bligh 1953, Bonetti and Dent 1954, Dent 1954, Jepson 1955, Evered 1956, Harris 1955). A short description of the clinical picture and basic biochemical findings is somewhat overdue and will enable the more detailed biochemical studies to be at last uncorked.

At first we described the syndrome among ourselves as "Hart's syndrome" (despite protests by one of us), and references to it under this name have appeared in the papers cited above. Among ourselves we have more recently called it by another very similar name, after the family surname, since alternative names which describe the main features of the disease—as in the title of this paper—have seemed to us to be altogether too unmanageable for ordinary usage. We prefer to withhold this name here in case of embarrassment to the family and will refer to it only as "H" disease.

Case-reports

Case 1.—In May, 1951, Mrs. H. wrote and requested an outpatient appointment at the Middlesex Hospital for her son E. H., aged 12. She said that his symptoms were those of pellagra, for which disease her eldest daughter (P. H.) had been treated at the hospital in 1937. Mrs. H. was concerned because the boy's symptoms had not responded satisfactorily to treatment with vitamin B. At interview the mother said that the boy had had a rash on the exposed areas of his face, neck, hands, and legs for the past three years. The rash was worst during spring and summer but improved during each winter. It had been especially bad during the past few weeks, and the skin was now rough and red and looked dirty despite scrubbing. The rash was irritant on the face and neck but not on the other affected areas. She also said that he had been "tottering like an old man" since the beginning of the year, and that his hands were shaky. His gait had been unsteady and he had tended to fall over, especially to the right side. This had recently become worse. He walked on a wide base and could not run so well as other children. The ataxia of his hands was worse with intention, and his handwriting was very bad. He had always been backward, and his mother compared his development unfavourably with that of his 8-year-old brother (Jh. H.). There was no history of fits, paræsthesiæ, or sphincter disturbances. His appetite had always been good, although he had distinct likes and dislikes.

Past History

He had been a full-term baby born by normal delivery and weighing about 8 lb. and had been breast-fed. His only illness had been measles.

First Admission

He was admitted to the Middlesex Hospital for investigation on May 31, 1951, he was only 4 ft. 2 in. tall, weighed 4 st. 7 lb., and was well built and of good muscular development. He was pleasant and coöperative but seemed backward in his response to questioning and in his social behaviour. The most notable feature was the dry scaly red rash on his face, neck, arms, hands, and legs (fig. 1). His legs and hands were rougher and dirtier than his face and neck. Finger-clubbing was absent, but his nails were longitudinally lined. His tongue did not show any special smoothness or soreness and his mucosæ were normal. No abnormality was detected in his cardiovascular system, lungs, or abdomen. His blood-pressure was normal.

Examination of the nervous system showed abnormal physical signs which varied from one examination to the next but gradually changed over many weeks. During his best periods he was left with mild ataxia of his hands and walked with a high-stepping gait. During his worst periods he had coarse nystagmus (both horizontally and vertically), bilateral ptosis, diplopia, and poor convergence. Tone in his limbs was slightly increased, with slightly increased deep reflexes but without demonstrable loss of power. His limbs showed mild ataxia, with fine movements poorly performed. He had a tremor of his outstretched hands, and his hands and tongue showed spontaneous involuntary movements. His plantar responses were equivocal. His fundi were always normal and his visual fields full, and no other cranial-nerve abnormalities were seen. Nothing abnormal was found in his sensory system. Dr. D. McAlpine and Dr. M. Kremer thought that he showed signs of a variable cerebellar syndrome with evidence of mild bilateral pyramidal involvement.

Progress.—The boy was put in the sun on two successive days with one hand exposed and the other covered. Slight irritation was caused in the exposed hand but no increase in erythema or scaling. Three-quarters of the expected erythema dose of ultraviolet light was given without any positive response. During his long inpatient stay the rash steadily diminished and almost disappeared, leaving only a scaly appearance of the skin.

Investigations.—Radiography revealed no abnormality. The urine was sterile on culture and contained no protein or

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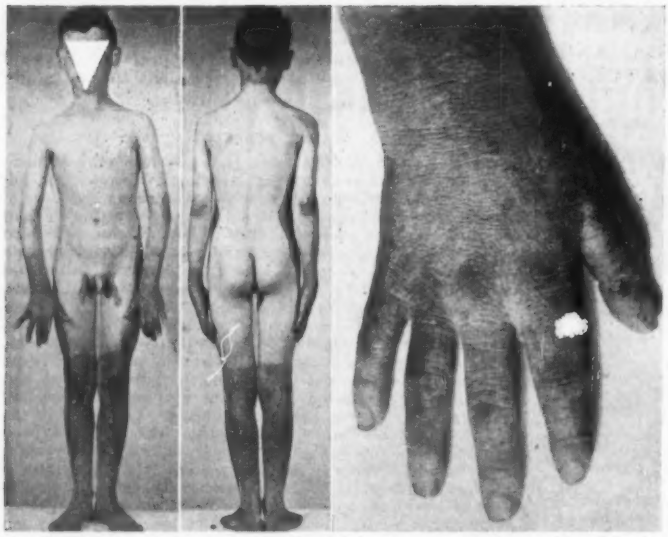

Fig. 1—Rash of case I on June 24, 1952, just before his second admission to the Middlesex Hospital.

reducing substances. Examination of the blood showed hæmoglobin 14·3 g. per 100 ml., white cells 7600 per c.mm. (neutrophils 59%, lymphocytes 35%, monocytes 5%, eosinophils 1%), erythrocyte-sedimentation rate 21 mm. in 1st hour (Wintrobe uncorrected), and Wassermann reaction negative. Lumbar puncture on June 6, 1951, produced cerebrospinal fluid (C.S.F.) containing a normal number of cells, protein 180 mg. per 100 ml. (positive Pandy test), chloride 695 mg. per 100 ml., and sugar 72 mg. per 100 ml. A Lange test was normal, and the Wassermann reaction negative. (This C.S.F. specimen was taken when the boy had well-marked neurological symptoms. A second specimen taken on July 27, 1951, when he showed clinical improvement, contained only 25 mg. of protein per 100 ml.) The blood-urea level was 31 mg. per 100 ml., serum/bicarbonate level 31 m.eq. per litre, potassium 4·9 m.eq. per litre, calcium 8·8 mg. per 100 ml., phosphate 5·6 mg per 100 ml., alkaline phosphatase 8·3 King-Armstrong units, and total plasma-protein level 7·3 g. per 100 ml. (albumin 4·9, globulin 2·1, fibrinogen 0·3 g. per 100 ml.). A 2-hour glucose-tolerance test showed 81 (fasting) 127, 117, 115, and 90 mg. per 100 ml. Bromsulphalein retention at the end of 45 minutes was less than 5%. All the routine investigations (except C.S.F. on June 6) gave normal results.

Diagnosis.—In view of the puzzling nature of the condition, the diagnosis of pellagra, as a dietary deficiency disease, was considered untenable, and no nicotinic-acid saturation test was done. The boy was seen by Prof. A. Kekwick, who suggested an abnormality of amino-acid metabolism. Further investigations for metabolic abnormalities were undertaken. A pyruvate-metabolism test (Dr. J. N. Cumings) gave a normal result. No excess porphyrins or porphobilinogen were found in the urine by standard qualitative laboratory tests, but the 24-hour faecal excretion of porphyrin was later found to be increased to 1·3 mg. (C. Rimington, unpublished work). The first biochemical abnormality was detected by quantitative analysis of the urine for amino-nitrogen, which showed 600 mg. per 24 hours (Folin's naphthoquinone-sulphonate method). A control on a child of the same age gave 41 mg. In the succeeding week the urinary excretion of aminonitrogen varied irregularly between 530 and 1130 mg. per 24 hours. Differential analysis of the nitrogen constituents of the urine gave the following results on a 24-hour excretion: protein nil; urea nitrogen 5·8 g.; uric-acid nitrogen 67 mg.; creatinine nitrogen 42 mg.; creatinine nitrogen 215 mg.; aminonitrogen 620 mg.; ammonia nitrogen 300 mg. Other tests of renal tubular function gave normal results. After taking ammonium chloride the boy passed acid urine (lowest pH observed 5·0) with a normal increase of ammonia.

Paper chromatography of the urine for amino-acids revealed gross amino-aciduria with grossly abnormal excretion pattern (fig. 2*a* and *b*). Relatively little additional α-amino-acid nitrogen and no new amino-acids were released on hydrolysis of the urine. Paper chromatography of plasma and of C.S.F. (July 27, 1951) showed a normal pattern of amino-acids. Tests showed a high but variable urinary excretion of indigogenic material (indican), later shown to be entirely indoxyl sulphate. This led in turn to a more complete investigation of the urinary indoles, mainly by paper chromatography (Jepson 1955). A characteristic and constant excretion pattern of urinary indoles and related Ehrlich reactors was seen (fig. 3).

Second Admission

The patient was readmitted to the Middlesex Hospital on Aug. 7, 1952. During the year he had had attacks of unsteadiness in walking and tended to collapse without loss of consciousness. His temper had become violent, outbursts arising over very trivial matters. For a short time he had complained of pain in his back and he had lost more than 1 st. in weight in the preceding year. He was said to have become more backward and to have lost his previous interest in reading. In early June he had sunbathed for about one and a half hours one afternoon. His skin was "like beetroot" that evening and within the next few days had become raw and begun to ooze. The rash had become extensive and had lasted fourteen days before clearing again. From that time onwards he had not been out of doors. On admission he looked

Fig. 2—Urinary amino-acid chromatograms showing gross amino-aciduria of H disease. The amino-acids can be identified by reference to standard "maps of the spots." In each case the sample of urine (containing 250 μg. N) was placed at the bottom right-hand corner: 2*a*, case I (chromatogram run with butanol-acetic acid mixture as first solvent upwards followed by phenol-ammonia from right to left); 2*b*, case I (chromatogram run with phenol-ammonia as first solvent from right to left, followed by collidine-lutidine upwards: this chromatogram is typical of all the chromatograms run at different times from the four affected members of the family) 2*c*, case of Hickish (1955); same solvents as in 2*b*; 2*d*, case of Hersov (1955), same solvents as in 2*b*.

unwell and was less cheerful than on his previous admission. His skin rash had improved greatly since June. He had obviously lost weight, and there was evidence of muscle wasting, especially in his arms. His back showed dorsal kyphosis and lumbar lordosis, which could be straightened. He had severe nystagmus in all directions but no other abnormality of the cranial nerves. The tone was increased in his limbs, with exaggeration of the deep reflexes. His sensation was normal, but he had mild ataxia of his hands and walked on a wide base. Biochemical investigation confirmed the previous abnormal findings. In addition the 24-hour urinary excretion of 17-ketosteroids was normal. Tiselius electrophoresis of the serum-proteins (Dr. P. A. Charlwood) showed a decrease of albumin and an increase of α_2 and γ-globulins, presumably associated with the febrile illness. The urinary excretion of indoles and of nicotinic-acid metabolites, and the changes produced by single administrations of nicotinic acid, nicotinamide, and tryptophan, and a 6-day course of aureomycin were investigated. The excretion of nicotinic-acid derivatives (Dr. E. Kodicek) was normal in pattern and amount, though on the low side, but surprisingly little affected by additional tryptophan. The level of indole excretion was greatly raised by tryptophan but unaltered by aureomycin except for the indican, which disappeared completely. Aureomycin did not affect the urinary amino-acid pattern. From Aug. 22, 1952, the patient progressively deteriorated. He first complained of pain in his neck, for three days. On Aug. 26, 1952, he developed moderately severe choreiform movements of his hands and complained of double vision and headache. During this period he lost interest in normal activities and was reluctant to play. On Sept. 8, 1952, he had a sore throat and mouth and became febrile. A throat swab produced a scanty growth of β-hæmolytic streptococci sensitive to penicillin. For the next ten days the patient remained pyrexial despite a course of systemic penicillin. During the febrile illness he showed nystagmus, choreiform movements, and increased limb tone and deep reflexes, and complained of diplopia and headache. As the temperature subsided he began to have diarrhœa, which persisted for three weeks. Repeated examination of the stools showed no pathogenic organisms, and serum-agglutination tests were negative. During the febrile illness and the subsequent period of diarrhœa the neurological signs became more pronounced, but they improved as the general condition became better. Even greater was the change which took place in the boy's general behaviour. During the acute phase of the illness he became very uncoöperative. At times he would lie immobile often under the bedclothes, and would refuse food and the usual nursing attentions. His habitual cheerfulness deserted him, and he became very depressed, inert, and anorexic. These manifestations disappeared as his general condition improved and his weight increased. By Nov. 12, 1952, he was again very well and was discharged for a holiday by the sea.

Fig. 3—Urinary indole chromatogram, treated with Ehrlich reagent, showing abnormal indole compounds excreted in H disease. Urine 70 µl. was placed in bottom right-hand corner and run with iso-propanol-ammonia as first solvent upwards, followed by butanol-acetic acid from right to left (for identification of spots see Jepson 1955).

Third Admission

He was transferred to the metabolic ward of University College Hospital on Jan. 6, 1954, from the Southern Hospital, Dartford, where he had been admitted on Dec. 28, 1953. At Dartford he had been incapable of giving any history. According to his mother, he had said he had felt ill the day before and had been in bed all day. He had then become very sick and feverish, with persistent vomiting, and had begun to behave peculiarly. He was restless and delirious, with severe photophobia, temperature 104°F, and pulse-rate 140. No cause for his pyrexia was found. He had a leucocytosis of 13,000 per c.mm. He was given penicillin and sulphadiazine, which brought his temperature down within 24 hours, and by this time it was possible to note that he had a severe nystagmus, intention tremor, overactive reflexes, ankle clonus, and flexor plantar responses. On arrival at University College Hospital he was better but still confused, irrational, and unable to give a history. His temperature had fallen to 100°F. No physical signs, apart from the neurological ones, were discovered. He had no skin rash. He improved gradually on antibiotic therapy, and it soon became clear that he had gross cerebellar ataxia but no definite pyramidal signs. His white-cell count was normal, and no pathogenic bacteria were isolated from sputum, throat swab, urine, or stools. His plasma contained sodium 145·5 m.eq. per litre, potassium 4·05 m.eq. per litre, chloride 104 m.eq. per litre, bicarbonate 26·3 m.eq. per litre, and urea 24 mg. per 100 ml. His urea-clearance was 113% and 85%. The serum-albumin level was 4·7 g. per 100 ml., serum-globulin level 2·5 g. per 100 ml., and serum-bilirubin level 0·4 mg. per 100 ml. Colloidal-red, cephalin-cholesterol, and thymol-turbidity tests were normal. Paper electrophoresis of serum-proteins (Jan. 12, 1954), chest radiography, and electrocardiography were normal. After a few days the patient began to feel better, but his neurological signs remained grossly abnormal. From Jan. 19 he was given nicotinamide 250 mg. daily until he went home; this coincided with continued gradual improvement. On Jan. 28, 1954, when he was greatly improved, he was seen by Sir Francis Walshe. He then showed mild cerebellar signs, more left than right; there were definite pyramidal signs, the reflexes being all hyperactive, ankle clonus being present on both sides, and the Babinski reflex positive. He could walk rather unsteadily with a wide base. He went home further improved on Jan. 30, 1954. He was followed from then on at University College Hospital, being seen regularly every few months. In March, 1954, he had no residual cerebellar signs and was walking well and was very active. In May he had begun work and was symptom-free. In July we noted for the first time that his dorsal kyphosis, previously only slight, was now very severe. Radiography showed wedging of the vertebræ, but otherwise no radiological diagnosis could be made. He was keeping out of the sun but had at this time a rough reddish rash on the backs of his hands. He was by now finding his job (as a riveter) difficult, we presume because he was not very good at it.

Fourth Admission

He was readmitted to University College Hospital on Jan. 8, 1955. He stated that he had been sick and feeling ill three days before admission, after which he had had some very severe diarrhœa for a day and a night, which had cleared up by the time he came to us. A similar illness had recently been passing through other members of his family, who were all now recovering. According to his family doctor (Dr. W. G. D. M.) he had been having dizzy attacks and feelings of weakness during the previous six weeks and had a mild intention tremor a fortnight before, nystagmus having developed a few days before admission. Since he was then working as a deck-hand on a pilot cutter, it seemed that he was in some danger from his work. On examination his temperature was 99°F. He did not look ill, and no physical signs were found except definite slight nystagmus and cerebellar incoördination of his left arm. His tendon-reflexes were exaggerated and both plantar reflexes flexor. He continued to have very slight pyrexia and, when a stool culture grew *Shigella sonnei* he was given a week's course of succinyl sulphathiazole. He improved neurologically during this time, and his stools did not grow any pathogens on culture. He was about to go home when he complained of more unsteadiness; his ataxia had become worse, and his stools again grew *Sh. sonnei*. This time he was given aureomycin and nicotinamide 250 mg. daily. He improved on this and was discharged in fair condition on Feb. 4, 1955. Subsequent follow-up has been uneventful. He had no recurrence of

illness, no rash, and no cerebellar signs apart from occasional slight lateral nystagmus. His trouble now is that, because of the progression of his disease, no suitable work can be found for him.

Case 2.—A girl, aged 6 years, sister of case 1, was admitted to the Middlesex Hospital on May 3, 1937, under the care of Dr. Alan Moncrieff. From the age of 3 months she had had a rash, always worse in the summer months. Her mother had noticed no other abnormalities until the girl was aged 5 years, when she showed deterioration of mentality, difficulty in walking, attacks of falling, wasting of the legs, and urinary and fæcal incontinence. The subsequent clinical findings included urinary and fæcal incontinence, emotional instability, dermatitis of the exposed areas, and an ataxic gait. Pellagra was diagnosed and treated with oral liver extract, 'Marmite,' 'Adexolin,' and 'Torost.' The girl was discharged on Aug. 19, 1937, showing great mental improvement, only occasional incontinence, a normal gait, and complete clearing of the rash. Dr. McAlpine saw her at that time and found mental retardation, great emotional lability, and lack of interest. She had severe nystagmus in all directions and increased deep reflexes in her legs but no definite ataxia. She had, however, an unsteady gait, walking on a wide base and staggering. There were no abnormal laboratory findings, but none of the tests which later proved relevant were done. Her fæcal fat was normal (31·5% of dried fæcal weight) and she had slight normochromic anæmia (hæmoglobin 11·4 g. per 100 ml.). In March, 1938, the rash returned to her hands and face without any of the other symptoms. After treatment in hospital she improved in mentality and behaviour, her nervous system was free from abnormality, and she benefited from nicotinic-acid therapy. The rash came back in May, 1939, and again responded to nicotinic acid during a month's treatment in hospital. Her mental state was less happy at this time, and her school report said that she had been trying to get her sister into trouble and was shy and solitary. Nicotinic-acid therapy was continued during the summer. In 1940 the rash recurred; in 1941 she was said to be very slow at school. During subsequent years she did not again attend the hospital until her brother presented with the same symptoms.

Second Admission

She was admitted to the metabolic ward of University College Hospital on Dec. 10, 1951, complaining of falling attacks over the previous three months. She had also lost some weight and had pain in her back. It seems likely that her attacks were vasovagal in origin since they only came on when she was standing and when she was tired. Her family were very worried because she had fallen at work and had to be kept away from machinery. Her mother was definite that similar attacks had occurred in childhood while she had the severe rash. On the present occasion there was no recent history of a rash. She showed no physical signs on examination. Her skin and nervous system were normal. Her blood-pressure was consistently about 90/60 mm. Hg. The pain in her back was not easy to interpret; it was intermittent and in her right loin. Investigation of the plasma sodium showed 148 m.eq. per litre, potassium 4·3 m.eq. per litre, chloride 104 m.eq. per litre, bicarbonate 24 m.eq. per litre, calcium 10·2 mg. per 100 ml., phosphorus 4·2 mg. per 100 ml., urea 30 mg. per 100 ml., urea-clearance 60% and 100%, and alkaline phosphatase 8·2 King-Armstrong units. Urinary concentration of urea to 3·7 g. per 100 ml. was obtained. When the girl was given oral ammonium chloride 5 g. in one dose she readily passed acid urine (pH 5·5) with a normal increase of ammonia. She had gross amino-aciduria of the same pattern as case 1 with indicanuria, and her fæcal output of protoporphyrin was increased (C. Rimington, unpublished work). Radiography of chest and spine was normal. We could not demonstrate increased skin sensitivity to various forms of artificial light (visual or ultraviolet), even when a naked carbon arc was used. Because of the hypotension, adrenal cortical function was investigated; the eosinophil-count was 317 per c.mm. and fell to 78 after treatment with corticotrophin. During her stay in hospital the patient had a few typical vasovagal faints; but on one occasion she had another form of attack while she was by herself, during which she was found by a nurse lying on her bed stiff, pale, and unresponsive to questioning or to stimuli. She slowly recovered consciousness in a minute or two, complaining of numbness in her right hand. The various investigations in hospital did not suggest any special form of treatment, but in view of her high urinary amino-acid loss she was prescribed calcium caseinate 30 g. daily to take at home. She was in good clinical condition on leaving. She has been followed every few months from that time to at least February, 1956, when she had remained at work without any serious illness and had been kept under regular observation. In June, 1952, she had rough skin in the front of her ankles, which had peeled in places. This healed rapidly during the next months while she was taking nicotinamide 100 mg. a day. Nicotinamide was then stopped. The rash did not come back that year. It returned, however, from April to July, 1953, and again a month's course of nicotinamide gave a possible but unconvincing response. The patient had by this time had no more faints and was having no more loin pain. From then until now she has remained in good condition, occasionally admitting to having done mild sunbathing but not suffering from any serious rashes. During the whole of the time she has been followed at University College Hospital she has developed no definite neurological signs.

Investigation of Family

When it became clear that cases 1 and 2 were affected by the same disease, it seemed probable that we were dealing with an inherited condition. This was supported by the fact that the patients' parents were first cousins. Their immediate relations were therefore examined. Neither of the parents and none of the six siblings at that time gave any clear clinical history suggesting that they were similarly affected, although a sister (M. H.) was much retarded mentally. However, specimens of urine were obtained in August, 1951, from all of them and examined chromatographically for amino-acids.

Amino-aciduria

Two of the brothers, Jh. H. and H. H., then aged 8 years and 6 years respectively, had gross amino-aciduria strikingly similar to that of cases 1 and 2. No abnormality was detected in the urine of the four other siblings and both parents. The pedigree and a diagrammatic representation of the chromatographic findings are given in fig. 4.

The gross amino-aciduria observed in the four siblings was quite different from any generalised amino-aciduria which we had previously observed. Alanine, serine, asparagine, glutamine, valine, leucine, isoleucine, phenylalanine, tyrosine, tryptophan, and histidine were present in the urine in much greater quantities than is normally found; furthermore the relative proportions of these amino-acids appeared to be very similar in all four siblings. The excretion of cystine, lysine, and glycine was only moderately increased compared with the normal; taurine was present in about normal amounts; and proline, hydroxyproline, methionine, and arginine were not detected. Perhaps the most striking difference in pattern from the generalised amino-acidurias found in conditions such as the Fanconi syndrome and Wilson's disease was the absence of any abnormality in the excretion of proline. Quantitative determinations by the Moore and Stein ion-exchange analysis have now been published (Evered 1956).

The amino-aciduria is evidently of renal origin. Dent and Fowler showed (Dent 1954) that the level of α–NH_2–N in the plasma of all four siblings with amino-aciduria was within normal limits in the fasting state, and that the renal clearances of α–NH_2–N were greatly increased. Similarly Evered (1956) has found that the plasma levels of the amino-acids taken individually are within normal limits, and that the renal clearances of the amino-acids excreted in excess are much greater than the normal values. It is clear that each of these four siblings has a similar and highly specific disturbance in renal tubular reabsorption of amino-acids. We suggest that this excretion pattern be termed the H amino-acid pattern.

The amino-aciduria has persisted unchanged for several years during which these patients have been under observation. During this time signs of the photosensitive skin reaction observed in the two older children

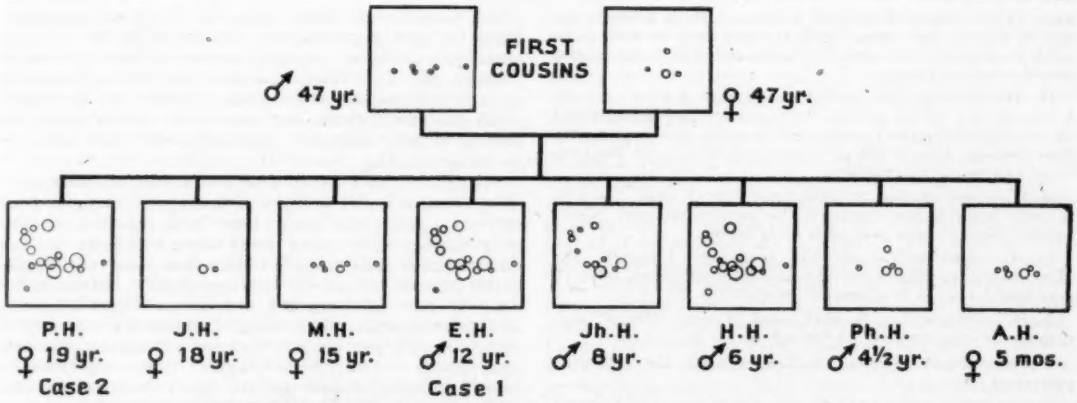

Fig. 4—H family tree, showing urinary amino-acid chromatogram of each member.

Each chromatogram has been prepared as in fig. 2*b*. Strength of amino-acid spot is represented by size of circle. Note that four siblings have gross amino-aciduria of identical pattern, although total strength may vary somewhat. Rest of family show normal amino-acid excretion.

have appeared also in one of the younger ones, and there is little doubt that they all have the same basic disorder. The renal disturbance evidently precedes the appearance of detectable skin and neurological involvement and may well be present from birth.

The sharp segregation of the amino-aciduria in the sibship, the absence of any such abnormality in the parents, and the fact that the parents are first cousins make it highly probable that the disease is caused by a rare recessive gene for which the affected individuals are homozygous. The mental defect in M. H. is probably an unrelated condition, although it may also be genetically determined, the parents being first cousins.

Indole Compounds

A similar survey of the urinary excretion of indole compounds was undertaken. The indole pattern shown in fig. 3 was found, with minor variations, in all the urines showing the amino-acid pattern. Its outstanding feature was the increase of indican and the triad of tryptophan, indolyl-acetic acid (50–200 mg. a day), and an unidentified indolic material U.I. (fig. 3). The level of indolyl-acetic acid was confirmed by plant-growth measurements (Prof. T. A. Bennet-Clark). No tryptamine, serotonin, 5-hydroxy-indolyl-acetic acid, or indolyl-lactic acid was detectable. The pattern has not yet been found in healthy people or in any other cases of gross amino-aciduria. We have not been able to test the urine from a patient with dietary pellagra, but abnormal indoles have been reported in such cases (Handler 1947).

Further Investigations

Since symptom-free members of the family were clearly implicated in the disease process we examined them further and obtained the following results:

J. H., female, aged 18½.—She had a perfectly normal previous history, and although the mother could not remember any of the dates of the normal milestones she was convinced that they had been passed at the usual times. There had been neither skin rashes nor neurological symptoms. On physical examination she appeared healthy. Chromatography showed no evidence of the family abnormality.

M. H., female, aged 15½.—It is difficult to assess the past history in this girl because the history from the mother suggests a mixture of psychotic and backward behaviour, with the possession of "two natures": sometimes she was most easy-going and affectionate, but at other times she was bad-tempered, upset, screaming, and miserable. There had been no history of skin rashes or of definite neurological lesions, but at the age of 11 years she was referred to a psychiatrist, and the mother was told that the girl would be backward but never at the bottom of her class. Mrs. H. felt that there had been deterioration since that time. On physical examination she appeared healthy. Chromatography showed no evidence of the family abnormality.

Jh. H., male, aged 8¾ years.—Mrs. H. felt that the boy was not so bright as he had been. There had been no definite physical illnesses except measles, but for the past year or two he had a weeping rash behind both knees, unlike the spring and summer rash of the other affected children. His knuckles were also affected. There had been no neurological symptoms. The mother thought that he had changed since going to school and had recently become more disagreeable. On physical examination he did not look very strong. His skin showed a lichenified fissured eczema behind the knees and on the knuckles. No other significant physical abnormality. Chromatography showed the family abnormality.

H. H., male, aged 6¾ years.—No history of previous illness. No neurological symptoms and no rash when he was first seen. Mrs. H. had little comment to make on the boy, whom she considered to be normal. On physical examination there was no obvious abnormality and he appeared healthy. Chromatography showed the family abnormality.

Ph. H., male, aged 4½ years.—No history of previous illness. No skin or neurological symptoms. Mrs. H. considers him to be very healthy. On physical examination no abnormality was found. Chromatography showed no evidence of the family abnormality.

A. H., female, aged 1 year.—A healthy baby who had no illness. At the age of 11 months she stood well and was almost ready to walk. On physical examination no abnormality was found. Chromatography showed no evidence of the family abnormality.

Psychology

The reports of the psychologist (Mr. S. H. Coates) and of his conversations with Mrs. H. on Feb. 13, 1952, are summarised as follows:

P. H.—Seen on Jan. 30, 1952, aged 20. I.Q. 61. Mental age 10 yr. 6 mos. A friendly girl though rather slow and of low intelligence. Mrs. H. says that she began to deteriorate when she first went to school, since when she has always seemed very simple.

J. H.—Seen on Jan. 8, 1952, aged 18 yr. 5 mos. I.Q. 112. A pleasant, friendly, and sensible adolescent of high average intelligence. Mrs. H. says that she is entirely normal.

M. H.—Seen on Jan. 8, 1952, aged 15 yr. 6 mos. I.Q. 50. Mental aged 7 yr. 4 mos. A stolid uncommunicative girl of very low intelligence. Her unusual behaviour differed much from that of the rest of the family. Mrs. H. says that she had always been different as a baby, was backward at school, and is now very difficult and queer.

E. H.—Seen on June 5, 1951, aged 12 yr. 1 month. I.Q. 74. Mental age 9 yr. A cheerful boy who seemed in many

ways like a normal child aged 9 years. He is a borderline case of mental deficiency. Mrs. H. says that he used to be most considerate but over the previous 12 months he has become very bullying.

Jh. H.—Seen on Jan. 8, 1952, aged 8 yr. 9 mos. I.Q. 93. A friendly boy of low average intelligence. Mrs. H. says that he is not so bright as he was, and over the past few months there has also been a change in his personality; he has been becoming more disagreeable.

H. H.—Seen on Jan. 8, 1952, aged 6 yr. 9 mos. I.Q. 101. A very friendly boy, perhaps the most intelligent of the family. Mrs. H. says that he is fairly clever.

Ph. H.—Seen on Jan. 8, 1952, aged 5 yr. 1 month. I.Q. 110. A very friendly boy of high average intelligence. Mrs. H. says that he is the brightest of the children.

A. H.—Seen on Jan. 8, 1952, aged 11 mos. Mrs. H. says that she is very forward for her age and is no trouble.

To the above reports Dr. Coates adds the following appraisal:

As will be seen, the intelligence quotients diminish with increasing age, except where the syndrome is absent. So far as could be found, Mrs. H.'s histories confirmed the deterioration in the cases where the amino-acid test was positive. It does seem that a part of the syndrome is intellectual deterioration.

The exception is M. H. Even in this case Mrs. H. seemed to think she had got worse—as if there had been deterioration. In addition to a Binet test she also did the Koh's block design test, in which she scored an I.Q. of 41. One would probably expect this to be much lower if there were severe deterioration. On the other hand, M. H. could read at the 10-year level, though her mental age was only 7 yr. 4 mos., which suggests deterioration. Another problem with M. H. was that, clinically, she seemed at that time in some ways more psychotic than defective. She was said to be paranoid and depressed and appeared lacking in affection. Since then (May 21, 1953) she has been reported to be hearing voices. Without further testing, the provisional diagnosis is schizophrenia with mental deficiency. This condition is apparently not the result of the same deteriorating process as in the other children.

It is planned to re-examine the whole family.

Follow-up of Family since 1952

The follow-up of the more seriously affected members (cases 1 and 2) is mentioned above. The two other siblings with amino-aciduria have been seen at regular intervals.

Jh. H. has grown well and is now symptom-free except for roughness of the skin every spring, which on one occasion proceeded to redness and peeling of the exposed areas. On this occasion, which was in 1954, the beginning of the rash in May of that year coincided with his having giddy attacks and a tendency to fall over to the right side. He was then shown to have nystagmus laterally but no other definite neurological signs. In July that year, when his rash was at its worst, he was having giddy attacks three times a day, once seeming to stumble for no apparent reason. Then he had nystagmus vertically as well as laterally and was clumsy with supination and pronation. He was given nicotinamide and kept out of the sun and he made a slow improvement in the first few weeks. We are not convinced that this was due to the nicotinamide as his family doctor was fairly certain that the improvement had begun a few days before starting it.

H. H., the youngest member of the family with amino-aciduria, has shown neither skin rashes nor neurological signs till the time of writing. He is growing well and appears healthy.

The remaining members of the family have not been followed regularly but Mrs. H. assures us that they have had no trouble of this kind.

Discussion

We have described here four siblings who constantly excrete large amounts of amino-acids and of indole compounds in their urine and a large amount of protoporphyrin in their faeces. The clinical syndrome is complex and inconstant. Three of the four siblings show a mild photosensitivity of their skin of variable duration which sometimes, after exposure to direct sunlight, flares up into a generalised rash affecting the exposed areas and identical in appearance with that of classical pellagra (fig. 1). When the rash has been severe, and on a few occasions when acute pyrexia has developed (with no rash), there has been very severe cerebellar ataxia, which, however, was completely reversible in weeks or months.

We can find no published reports of such an association of symptoms and biochemical findings, though at least two other cases (see below) have been reported as cases of pellagra. The gross renal amino-aciduria in this disease has a pattern quite unlike that observed in other better-known conditions also genetically determined—e.g., the Fanconi syndrome, cystinuria, Wilson's disease, and galactosæmia. Excretion of indole 3-acetic acid in urine has not yet been looked for extensively, because appropriate screening techniques have only recently been developed (Jepson 1955); but it is found to some extent in phenylketonuria and has been implicated in dietary pellagra (Handler 1947). Our patients excrete 50–200 mg. or so daily. Their indicanuria may also be very striking (acidified urine may turn bluish black on standing) but it is inconstant and more variable than the other findings. It is a plausible suggestion that cases of H disease may present as indicanuria or with the deposition of indigo crystals in the urine. If it is due, as is usually thought, to intestinal decomposition of tryptophan, there must be a subtle reason why a genetic abnormality of this sort affects intestinal flora. In support of the intestinal theory is the fact that aureomycin given to cases 1 and 2 caused complete disappearance of the indicanuria which returned when the antibiotic was discontinued (J. B. Jepson and C. Rimington, unpublished observations).

The association of photosensitive skin rash and neurological abnormalities suggested porphyria cutanea tarda; but no porphyrin derivatives were found in the urine, and subsequent biochemical studies completely negative this possibility, which is also unlikely on a more close consideration of the clinical picture. True pellagra due to dietary deficiency of nicotinamide is almost impossible in this country, and its diagnosis was not supported by the dietary history or the neurological findings. Many other forms of photosensitive skin rash are mentioned in dermatology textbooks—e.g., Goldsmith and Hellier (1954)—but none in association with neurological disease. The latter, however, is inconstant in H disease; therefore possibly some cases of H disease are diagnosed only as skin diseases, and a further study of such cases by chromatography of the urinary amino-acids would be of interest.

Some other cases of H disease may presumably present, without skin rash, as severe cerebellar ataxia following respiratory or other infection. We have not yet discovered a case of such a disease in the neurological literature which had any other feature of H disease. Hereditary cerebellar ataxias are well known but are always insidious and progressive. Acute cerebellar ataxia following infection may occur in children and be followed by complete recovery. Berglund et al. (1955) describe six cases of this syndrome and review the literature, which they say includes fifty further cases. Some of their cases could well have been cases of H disease presenting in this way for the first time. Against this possibility is the fact that none of them has yet had more than one attack, nor is skin photosensitivity mentioned in the clinical descriptions.

Hickish (1955) has described a case of pellagra in an English child. The clinical features would pass for a case of H disease since, among other things, the dietary history was not wholly convincing and the patient's recovery under nicotinamide treatment was unusually slow. We were therefore pleased to be able to obtain and

test (by courtesy of Dr. D. Beynon) a specimen of urine from this child. It showed the characteristic H-disease amino-acid chromatogram (fig. 2*c*) besides containing the same indole metabolites. While the present paper was being prepared, we noticed a further description of a pellagra-like syndrome in a child presenting with acute psychosis (Hersov 1955). The syndrome described was remarkably similar to H disease, and in addition large quantities of indican had been found in the urine, a matter that was further studied by Rodnight and McIlwain (1955). We were able (by courtesy of these workers) to obtain urine from their patient. This also showed an amino-acid chromatogram (fig. 2*d*) identical with that of H disease and in addition contained the same indole metabolites. We can make a further point, now that these extra cases are available for comparison. Their family circumstances were economically difficult and had led to dietary irregularities. Such a situation is now uncommon enough in this country for it to be significant in the manifestation of disease. It may well be that clinical signs only appear under the provocation of such a poor environment and that, in more favourable circumstances, people showing the same biochemical disorders may pass as healthy all their lives. If this is so, this hereditary biochemical disorder may be comparatively common.

These two additional diagnoses raise further questions which we cannot now answer about the relationship of H disease to true vitamin-deficiency pellagra,§ and about the identity of all the previous cases of alleged pellagra described in this country (reviewed by Hersov 1955). Very many of the latter patients had recurrent rashes in spring and otherwise had clinical histories very similar to H disease. Moreover the first cases to be described in this country (Box 1913) occurred in two brothers, and the case of Stannus and Gibson (1934) showed increased fæcal excretion of a porphyrin not further identified but shown to be not hæmatoporphyrin. This question can be easily settled, retrospectively if necessary, in further cases of so-called dietary pellagra by testing the urine for amino-acids. The sequence of events leading to our diagnosis of the cases of Hickish and of Hersov illustrates well how absurdly simple a biochemical diagnosis may sometimes be when made on a drop of urine sent by post and obtained from the then clinically healthy patient even, as here, in the face of considerable clinical complexity. It is hoped that this will not be an encouragement to quack postal diagnosis (Bagnall 1954).

The present elder affected siblings were mentally retarded, the degree of retardation varying from an I.Q. of 61 in the eldest to 74, 93, and 101 as one passes to the younger siblings. There is a strong suggestion here (supported by the mother's account) that the biochemical defect may slowly cause progressive mental deterioration. An abnormality of indole metabolism has also been implicated in another form of mental disorder—phenylketonuria (Armstrong and Robinson 1954).

A further point can be made here about the clinical manifestations of a hereditary disease. One expects at first sight that a disease, present by definition from the moment of conception, should also be manifested at an early age. This, however, is well known to be not so, since many hereditary diseases—e.g., Huntington's chorea—may not appear till middle age, and others only appear on and off throughout life as a series of acute incidents following exposure to some outside influence—e.g., barbiturates in acute intermittent porphyria. It seems that one can never fully exclude a major influence of hereditary factors in any disease. Had the family history of our patients been less helpful, it would have taken a bold person to suggest that the disease was basically hereditary.

We have considered superficially the possibility of finding a unifying hypothesis which might correlate all the clinical and biochemical features of H disease. According to our present hopeful concept of biochemical genetics such a simple explanation should exist in the case of H disease with its firm genetic background. Our gropings so far have led us to wonder whether the primary gene action may assert itself as a disorder of tryptophan metabolism whereby a metabolic block exists somewhere along the pathway from tryptophan to nicotinic acid. If one also supposes that some enzyme systems in the body which require nicotinic acid or nicotinamide as prosthetic groups can only obtain their supply from the metabolism of tryptophan and not from dietary nicotinamide, the close mimicry of some of the clinical features of true pellagra can be well understood, as well as the occurrence of various indole metabolites in abnormal amounts. Rodnight and McIlwain (1955) suggest that the nicotinic-acid deficiency in their "pellagrin" (now shown to be a case of H disease) was caused by the diversion of tryptophan from its normal metabolic pathways into the pathway of indican formation. In fact the situation is worse than they supposed, because, in addition to the variable loss of tryptophan as indican, there is a daily loss of 100–200 mg. of indolyl-acetic acid and other tryptophan metabolites and even of free tryptophan itself. It might be noted that the quite different shunt of normal tryptophan metabolism represented by malignant argentaffinoma (carcinoid) can also lead to pellagra-like rashes (McNeely and Jones 1946, Thorson et al. 1954, Sjoerdsma and Udenfriend 1955).

In H disease there may well be a variation with age and stress in the requirement for "endogenous" nicotinic acid, which would explain the clinical deterioration with growth and infective disease and the possible later improvement in adult life. In the case of such a primary defect of indole metabolism the other biochemical abnormalities (e.g., renal amino-aciduria) would have to be considered as consequences, on the level of cellular metabolism, of an apparent nicotinamide deficiency: for example, from poisoning of the tubules by an abnormal indole metabolite, or as a deficiency disease of the tubules. It must still be borne in mind, however, that the opposite situation is also equally plausible—a primary disorder of amino-acid transport processes leading to the development of an abnormal gut flora which distorts the normal sequence of nicotinic-acid utilisation.

Summary

A new disease (H disease) is described affecting four of eight children of a first-cousin marriage.

The most constant clinical feature is a tendency to develop a rough reddened skin on exposure to moderate sunlight. In two of the siblings, greater exposure led on more than one occasion to a severe rash which appeared identical with that of pellagra. On occasion a severe but fully reversible cerebellar ataxia developed in association with the rash and also (in one of the patients) following infective disease without rash. The older affected siblings are also mentally retarded.

Among the biochemical findings is a constant gross renal amino-aciduria of unique pattern, without other evidence of renal dysfunction. This is the most specific abnormality by which the disease can be identified. There is also a constant large excretion in the urine of indole-3-acetic acid and a less constant large excretion of indican. The fæces contain a moderately increased quantity of protoporphyrin.

§ Through the efforts of Dr. R. Lewthwaite (director of Colonial Medical Research) and Dr. G. R. Wadsworth, we have now examined urine from an adult male African who had been on a diet low in nicotinamide and riboflavine. We understand that he had the typical clinical signs of pellagra, including skin lesions. His urine showed no abnormalities of amino-acid or indole excretion.

We wonder if the immediate biochemical disorder producing the clinical syndrome is an abnormality of nicotinic-acid utilisation.

In addition to our indebtedness to the many colleagues mentioned at appropriate places throughout the text, we wish to thank Prof. A. A. Moncrieff for providing the details of case 2 originally admitted under his care; Dr. J. Anderson, Dr. E. P. G. Michell, and Dr. B. W. Webb for help with the care of the patients; Dr. W. G. D. Murray, the family doctor, for his enthusiastic assistance in our investigation; Mr. C. F. M. Rose and his staff for help with the clinical biochemistry; and Miss D. I. Fowler and Mr. D. Cusworth for some of the paper chromatography; and the H. family for their full coöperation.

REFERENCES

Armstrong, M. D., Robinson, K. S. (1954) *Arch. Biochem.* **52**, 287.
Bagnall, H. H. (1954) *The Times* Sept. 22.
Berglund, G., Mossberg, H. O., Rydenstam, B. (1955) *Acta pædiat., Stockh.* **44**, 254.
Bligh, J. (1953) *J. Physiol.* **120**, 53.
Bonetti, E., Dent, C. E. (1954) *Biochem. J.* **57**, 77.
Box, C. R. (1913) *Brit. med. J.* ii, 2.
Dent, C. E. (1952) *In* Lectures on the Scientific Basis of Medicine London; vol. II, p. 213.
— (1954) *Exp. Med. Surg.* **12**, 229.
Evered, D. F. (1956) *Biochem. J.* **62**, 416.
Goldsmith, W. N., Hellier, F. F. (1954) Recent Advances in Dermatology. 2nd ed., London; chapter XII.
Handler, P. (1947) *J. Lab. clin. Med.* **32**, 428.
Harris, H. (1955) *Int. Congr. Biochem.* p. 467.
Hersov, L. A. (1955) *J. ment. Sci.* **101**, 878.
Hickish, G. W. (1955) *Arch. Dis. Childh.* **30**, 195.
Jepson, J. B. (1955) *Lancet*, ii, 1009.
McNeely, R. G. D., Jones, N. W. (1946) *Gastroenterology*, **6**, 443.
Rodnight, R., Mellwain, H. (1955) *J. ment. Sci.* **101**, 884.
Sjoerdsma, A., Udenfriend, S. (1955) *J. clin. Invest.* **34**, 914.
Stannus, H. S., Gibson, C. R. (1934) *Quart. J. Med.* **3**, 211.
Thorson, A., Björck, G., Björkman, G., Waldenström, J. (1954) *Amer. Heart J.* **47**, 795.

RESTRICTION OF FLUID INTAKE AFTER PARTIAL GASTRECTOMY

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The thirst that from the cell doth rise
Doth ask a drink divine.
With apologies to Ben Jonson.

IN the natural wild state a severely injured animal, lacking its normal capacity for defence or flight from new as well as old predators, must hide and be able to survive for several days without water or food; if the animal does not die from loss of blood or from infection, recovery during this period of starvation depends on the ability to provide from its own tissues not only the materials necessary for healing the injuries but also the continuing daily requirements of water and energy. Both herbivorous and carnivorous animals heal and survive at the expense of large metabolic disturbances. Man also possesses this inherent capacity to survive injury and starvation, but unfortunately most of the studies which have been made on the effects of injury in man have been complicated by the effects of administering intravenous infusions of saline or glucose solution. A simplification of the postoperative treatment of men operated on for chronic duodenal ulcer provided an opportunity to observe the response to severe injury, unmodified by intravenous therapy.

Methods

17 patients with chronic duodenal ulcer were studied before and after operation: 14, including 1 with a stomal ulcer, underwent partial gastrectomy (Billroth I, 9 cases; Polya, 5 cases) and 3 gastrojejunostomy. Throughout the period of study, which lasted up to three days before operation and up to ten days after operation, six-hourly collections of urine were made, with chloroform as the preservative. The daily periods began at noon and so far as possible, the operations also were arranged to start at this time. General anæsthesia (of various types) was used in all the cases. The specific gravity of the urine was measured with a hydrometer. The excretion of urinary sodium and of potassium was measured with an EEL flame-photometer, and of nitrogen by the micro-Kjeldahl method. The patients were weighed daily on a stretcher-type steelyard balance accurate to ±1 oz., the precautions advised by Benedict (1915) being observed. The intakes of food and fluid were accurately recorded, and the intakes of nitrogen, sodium, and potassium were calculated from the tables of McCance and Widdowson (1946).

After operation none of the patients was transfused or received any intravenous fluid. The stomach was aspirated hourly for twenty-four hours or longer. To relieve thirst the patients were encouraged to wash their mouths with water as often as they desired but had to abstain from drink for forty-eight hours after the operation; from forty-eight to seventy-two hours they were given 30 ml. of water to drink every hour; from seventy-two to ninety-six hours 60 ml. of water, milk, or other drink was given every hour; and from ninety-six hours a light diet was taken. Postoperative recovery was uneventful in all the cases and was not disturbed by the restricted intake of fluid.

Results

URINARY EXCRETION

Volume and Specific Gravity

The volume of urine passed in each twenty-four hours is shown in table I. There was wide variation in urinary volume from day to day between individuals and in the same patient, but despite this there was an indication of a gradual increase in urinary volume from the first day after the operation. The average values suggest that, under the existing régime of restriction of fluid for forty-eight hours, the initially low urinary volume increased sharply between seventy-two and ninety-six hours after the operation, during which period the intake of fluid amounted to 1200 ml. or more. Wide variations in the volumes of individual specimens of urine between patients in the same periods after the operation were at least partly due to difficulty in passing urine to time. When the daily totals are evenly spread, the urinary volume clearly tended to rise from 25 ml. an hour during the first forty-eight hours to 30–40 ml. an hour during the next four days and to 50 ml. an hour (which approaches the preoperative rate) on the seventh day. Despite the wide variations in the volume of urine none of these patients exhibited any sign of impairment of renal function, and recovery was uneventful in all the cases.

TABLE I—DAILY VOLUME OF URINE AFTER OPERATION

Case no.	Ml. per 24-hr. period										
	Before operation		After operation								
	2	1	1	2	3	4	5	6	7	8	9
1	890	..	870	725	(170)	1380	1165	1455	1790	1865	845
5	..	1700	670	600	520	1160	610	770	760	700	755
6	..	..	940	570	(135)	520	740	645	1110	840	860
7	..	605	330	1100	775	1070	970	..	..	..	..
8	..	..	110	670	1080	1020	1030	1170	1020	1460	1440
9	1040	1250	600	550	930	840	1060	850	860	1250	..
10	747	2025	694	303	567	817	957	465	350	950	..
11	..	665	355	330	290	1205	555	485	755	..	..
12	..	..	350	650	1040	600	900	..	..	..	..
13	..	695	1010	715	655	1100	605	735	890	535	785
14	..	905	645	600	1087	1165	815	880	850	685	865
15	..	1363	725	680	1118	935	954	1122	612	1247	1027
16	1470	1286	1035	452	457	767	932	1605	1132	..	..
17	..	..	705	940	1005	480	1475	900	1750	1560	1170
Average	1011	966	645	563	743	933	912	915	1073	1008	968

In tables I–III, where figures are shown in parentheses, it is doubtful whether the collection of urine was complete.

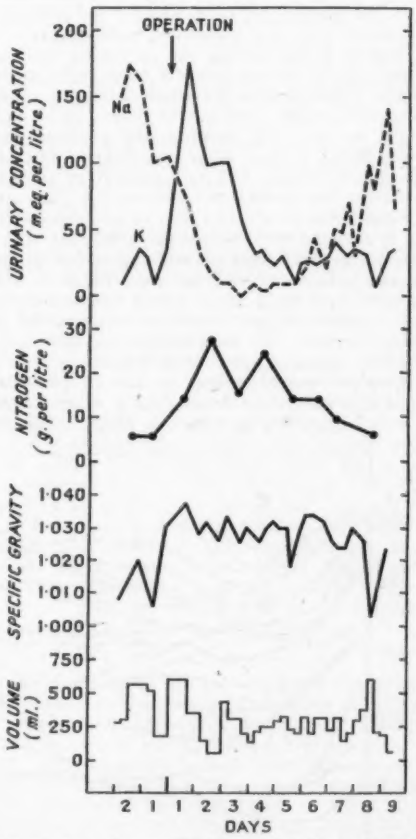

Fig. 1—Changes in urinary concentration of sodium, potassium, and nitrogen, specific gravity, and volume after partial gastrectomy with restriction of fluid intake (case 9). Concentration of nitrogen refers to 24-hour pooled urine, but all other estimations were made on individual specimens of urine.

There was an invariable increase in the specific gravity of the urine after the operation; in some patients this began up to twenty-four hours before the operation. The specific gravity was raised above the preoperative level for three, four, and eleven days in 1 patient each, six days in 3 patients, seven days in 2 patients, and eight days in 6 patients. A typical eight-day response is shown in fig. 1.

Sodium

The urinary output of sodium was measured in 14 patients (table II). In 11 of them there was a broad general pattern of behaviour: the daily output of sodium fell from above 100 m.eq. before the operation to less than 75 m.eq. in the first twenty-four hours after the operation, to less than 50 m.eq. (average 31·7 m.eq.) in the second twenty-four hours, and to less than 25 m.eq. (average 14·9 m.eq.) in the third, fourth, and fifth twenty-four hours; thereafter there was a wide variation in sodium excretion.

The following exceptions to this general pattern were observed:

In cases 13 and 14 the urinary excretion of sodium increased during the first twenty-four hours after the operation, but in both it subsequently decreased sharply.

In case 5 the urinary excretion of sodium remained plentiful throughout the postoperative period, although the daily quantities decreased from the second to the fifth day.

In case 15, after an initial decrease, the urinary excretion of sodium increased steadily during the third to sixth days and then decreased again.

In cases 7 and 17 the urinary excretion of sodium was greater during the second than during the first twenty-four hours after the operation.

Of the 5 patients who excreted more than 75 m.eq. of sodium in their urine during the first twenty-four hours 2 showed an increase over the preoperative level and a later decrease; in 1 the urinary excretion of sodium did not decrease to the usual degree at any time; and in the 2 other patients the decrease in urinary excretion of sodium was delayed.

The lowest daily output of sodium was on the second day in 2 patients, on the third day in 4, on the fourth day in 4, and on the sixth day in 4.

In cases 1 and 6 a low value on the third day appeared to be related to the very low urinary volume.

In cases 9 (fig. 1) the concentration of sodium in the six-hour specimens of urine showed that the concentration as well as the total quantity of sodium excreted in the urine followed a similar pattern. The conservation of sodium was progressive for forty-eight hours after the operation and lasted nearly five days.

In cases 1, 8, and 15 the urinary excretion of sodium remained more than the average throughout the post-operative period. In the 11 other patients some of the deviations from the pattern, especially in the first twenty-four hours, may have been due to difficulty in completely emptying the bladder. None of these patients was catheterised, and it was not always possible to feel the bladder at laparotomy and to ensure that it was empty. The inclusion of urine with a high sodium content from the preoperative period in the first post-operative specimen would greatly increase the apparent excretion of sodium after the operation. It is also possible that the onset of renal conservation of sodium was delayed in some of these patients, although subsequent conservation of sodium was usually good.

Potassium

The urinary output of potassium was measured in 14 patients (table III) and, like that of sodium, conformed to a general pattern. The daily output increased from 25–50 m.eq. before the operation to 75–125 m.eq. in the first two days after the operation, and decreased to 25–75 m.eq. in the third and fourth days and to 25–50 m.eq. in the fifth and subsequent days.

The largest output was on either the first day (7 patients) or the second (5 patients). The 2 other patients (cases 11 and 15) excreted a large amount of potassium for four days, the peak being on the third day in one and the fourth day in the other. In cases 7 and 16 small amounts of potassium were excreted in the first twenty-four hours and large amounts in the second twenty-four hours. Since the excretion of sodium was copious in the second twenty-four hours in both these patients, there

TABLE II—URINARY EXCRETION OF SODIUM

Case no.	M.eq. per 24-hr. period										
	Before operation		After operation								
	2	1	1	2	3	4	5	6	7	8	9
1	146·2	..	122·3	42·8	(5·1)	32·4	53·3	95·3	130·5	217·9	177·4
5	..	..	58·6	33·2	24·6	28·0	21·3	18·5	21·0	32·9	43·5
6	..	..	45·1	11·4	(1·7)	5·2	7·4	11·3	31·0	39·4	76·6
7	..	104·6	51·1	74·5	17·0	18·0	18·9	12·9	29·5	16·7	..
8	..	..	110·9	75·7	66·1	64·6	72·3	58·4	124·6	153·4	118·5
9	165·8	140·0	43·5	14·0	5·3	6·0	13·2	24·1	41·2	..	..
10	125·6	152·7	55·8	..	12·5	21·0	20·3	..	..	..	..
11	..	131·5	31·9	7·3	5·8	24·8	15·5	14·5	13·6	7·2	6·4
12	..	..	29·4	27·0	5·8	4·9	22·4	31·0	33·8	103·5	268·2
13	..	116·6	188·8	37·3	7·1	25·9	11·2	26·7	108·0	98·7	122·6
14	..	86·0	123·2	15·5	9·2	10·8	11·0	6·6	4·4	14·8	33·1
15	..	161·3	71·2	13·6	31·2	47·1	61·1	78·6	33·2	37·5	..
16	196·9	94·3	63·4	2·2	4·7	12·9	14·7	22·2	..	15·8	..
17	..	..	43·9	58·4	13·7	3·1	44·9	18·5	207·3	180·1	142·9

TABLE III—URINARY EXCRETION OF POTASSIUM

Case no.	M.eq. per 24-hr. period										
	Before operation		After operation								
	2	1	1	2	3	4	5	6	7	8	9
1	39·0	..	106·7	121·3	(15·3)	107·1	61·2	56·7	51·4	95·6	55·0
5	..	47·0	116·0	62·6	48·0	75·0	37·6	43·6	42·6	34·4	30·6
6	..	..	151·7	71·2	(15·5)	32·5	30·5	28·9	50·5	50·0	71·4
7	..	38·4	8·2	138·2	63·3	49·3	36·6	30·3	61·0	40·5	..
8	..	..	112·2	51·8	27·5	28·1	36·2	24·3	41·1	39·5	42·3
9	23·8	26·2	105·0	69·9	37·6	24·6	23·25	22·9	30·6	..	..
10	29·4	39·0	86·5	..	63·5	60·0	45·9	..	..	..	..
11	..	64·6	63·5	62·6	41·8	72·6	20·4	25·5	26·0	16·25	..
12	..	..	36·2	110·1	47·9	17·9	35·9	30·1	18·3	49·3	70·9
13	..	29·9	119·0	85·8	59·1	70·9	33·5	30·5	35·8	26·7	34·1
14	..	25·5	83·6	102·3	85·5	64·9	60·5	39·9	52·6	40·7	47·3
15	..	41·8	79·7	65·8	87·8	73·1	30·3	43·2	28·5	41·0	..
16	36·5	21·0	118·6	37·1	49·0	72·5	61·5	74·1	..	50·5	..
17	..	..	62·0	79·7	62·6	10·8	37·8	27·7	57·8	41·4	46·4

may have been some delay in passing the urine. In cases 1 and 6 the very small urinary output of potassium on the third day appeared to be related to the low volume of urine.

The very large increase in the concentration of potassium in the urine after the operation is shown in fig. 1. This increase occurs when the concentration of sodium in the urine is decreasing and lasts for sixty hours before returning to the preoperative level. The remarkable inversion in the ratio between the concentrations of sodium and of potassium in the urine is well shown. Despite the restriction of fluids after the operation, the urinary output of potassium closely resembled that previously reported (Wilkinson et al. 1950b). The concentration of nitrogen in the urine increased less rapidly than that of potassium and remained increased from five to eight days. In fig. 1 the concentrations of nitrogen and potassium are plotted on the same scale as their concentrations in skeletal muscle (3·0 m.eq. of potassium per g. of nitrogen). During the first twenty-four hours potassium was excreted at a much higher concentration than nitrogen, but during the next forty-eight hours the concentrations were about equal. From the fourth to the sixth day the concentration of nitrogen in the urine exceeded that of potassium.

BODY-WEIGHT

Loss of weight is a usual sequel to major accidental injuries or to surgical operations and may amount to 10% or more of the initial weight before injury. The time of onset of this loss of weight, but not its degree, appears to be related to the type of postoperative treatment. In the present patients, who for forty-eight hours after operation were not given any water or sodium, the loss of weight began during the operation and usually progressed rapidly during the first forty-eight hours. In 15 patients weighed daily the greatest amount of weight had been lost after twenty-four hours in 1 patient, forty-eight hours in 3, seventy-two hours in 8, and ninety-six hours in 3. After the fourth day all the patients gained weight, but only 2 regained their initial weight during the period of observation. The greatest loss of weight was 11·3% (6·7 kg.) of an initial weight of 59·7 kg. in seventy-two hours (case 6, Billroth I) and the smallest 2·1% (1·27 kg.) of 60·7 kg. (case 2, gastro-jejunostomy) (table IV and fig. 2). There is a broad general pattern of rapid initial loss of weight followed by a period of little change, which is succeeded by a slow increase in weight. The total weight lost does not bear any constant relationship to body-weight.

TABLE IV—CUMULATIVE POSTOPERATIVE CHANGES IN BODY-WEIGHT

Case no.	Initial post-operative weight (kg.)	Daily weight change (% of initial postoperative weight)									
			2	3	4	5	6	7	8	9	10
1	59·0	3·1	4·6	..	*5·3*	4·3	4·5	5·3	..	..	..
2	60·7	*2·1*	1·4	0·5	..	+0·5	1·3	..	2·9	5·5	5·9
3	45·1	3·1	5·8	*7·8*	4·31	4·0	..	..	..	..	..
4	49·3	3·7	*3·9*	2·5	2·0	0·7	..	..	..	..	..
5	67·3	6·0	6·3	*7·5*	7·1	5·0	3·6	3·7	3·4	..	..
6	59·7	7·3	10·7	*11·3*	11·1	10·3	9·3	..	..	9·2	..
7	68·4	2·9	6·7	7·7	*8·6*	7·0	7·6	7·4	5·1	3·9	2·4
8	63·9	4·7	6·7	*7·7*	7·7	6·1	6·3	6·9	6·9	6·3	6·6
9	55·1	7·7	*10·4*	9·6	9·1	10·0	9·8	10·4	9·0	10·2	..
10	58·8	2·6	6·0	5·2	*7·1*	5·7	5·9	..	..	..	..
11	65·6	5·3	6·6	*7·2*	5·9	5·2	5·3	..	4·8	4·7	..
12	51·6	2·8	4·4	*5·9*	5·6	5·5	5·3	4·6	..	2·3	3·8
13	68·3	3·0	5·8	*6·9*	6·2	4·2	2·3	2·6	2·0	2·6	..
14	66·9	3·5	6·3	*6·5*	5·9	5·7	..	3·6	4·0	2·1	..
15	62·5	2·1	*3·8*	3·2	3·2	2·5	3·5	..	..	4·4	3·6

The postoperative weight exceeded the weight at the end of operation only in case 2 from the fifth day onwards.
The figures in italics indicate maximal loss of weight.

The average loss of weight in the 15 patients was 3·99% after twenty-four hours, 6·3% after forty-eight hours, and 7·4% after seventy-two hours. The rate of loss varied from day to day and was in all but 2 cases largest in the first twenty-four hours. The group averages were 39·9 g. per kg. in the first twenty-four hours, 23·3 g. per kg. in the second, and 10·8 g. per kg. in the third; in 2 patients the rate of loss was more than 70 g. per kg. in the first twenty-four hours. During the first two days these rates of loss are much larger than the 11·2 g. per kg. which Benedict (1915) concluded was the usual rate in the initial phase of simple starvation.

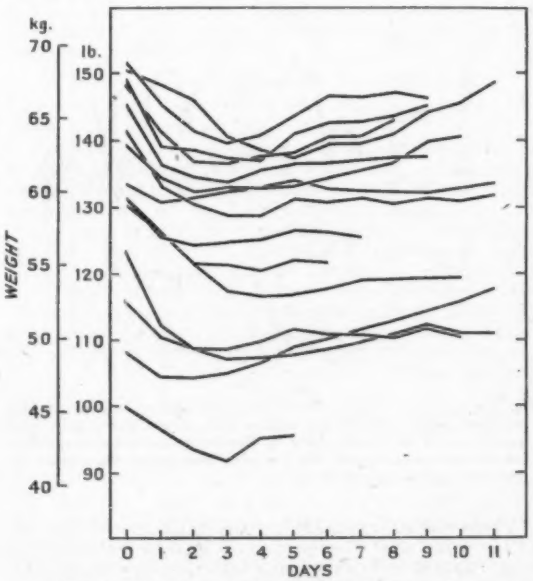

Fig. 2—Daily changes in body-weight after operation.

THIRST

All the patients complained of thirst. They were usually drowsy until the evening, and thirst was first noticed between 6 P.M. and midnight. It became severe about eighteen hours after the operation (early next morning) and remained severe from eighteen to twenty-four hours and occasionally up to four days. The patients said that their mouths felt sticky and gluey, their lips were dry and tended to stick together, and their tongues tended to stick to their palate. There was no special taste. Thirst was best relieved by washing out the mouth with ice-cold water, such relief lasting ten to

twenty minutes. In some patients the thirst had become less intense even before the intake of fluid was resumed, but in others it persisted for some time after drinking began. In other patients not included in the present series, who were closely observed after operation, post-operative thirst was not relieved by intravenous 5% glucose solution or 0·9% saline solution, or by water per rectum. When drinking was permitted and gastric distension was prevented by repeated aspiration of the gastric contents, thirst was relieved for only ten to twenty minutes.

COMPOSITION OF BLOOD

During the first four days after the operation there were small changes in packed-cell volume and in the concentrations of sodium and potassium in peripheral venous blood. The greatest deviation from the chemical patterns of the blood previously reported after partial gastrectomy (Wilkinson et al. 1951) was delay in the onset of the hæmodilution, indicated by the packed-cell volume. In the earlier series of patients, all of whom received intravenous 0·9% saline solution and 6% glucose solution after the operation, the packed-cell volume began to decrease within forty-eight hours after the operation. In the present patients the packed-cell volume often increased by up to 2·5% for one or two days and did not decrease below the preoperative value until four or five days after the operation. The changes in concentration of sodium and potassium in venous blood were less constant but tended to increase slightly for two or three days. Further observations on these changes in composition of the blood are being made.

Discussion

The main object of this investigation was to observe what happened to the metabolic response to injury after operations such as gastrojejunostomy and gastrectomy when the intakes of water, sodium, and potassium were stopped for forty-eight hours. The patients all made satisfactory recoveries from their operations and were not harmed by the restrictions imposed on them, although they experienced intense thirst. So far as can be judged, this thirst was not more severe than some of them had already experienced after either perforation or hæmatemesis or a previous operation. It seems likely, however that the restriction of fluid somewhat intensified the thirst.

The average volume of urine passed by these patients after operations were much smaller than those commonly recommended or believed to be adequate. During the first forty-eight hours the average volumes approached the smallest volumes of urine of adults with normal renal function (Gamble 1954), but the wide range of individual variation sufficiently emphasises the need for caution in laying down arbitrary limits for urinary volume.

Throughout their period of observation Le Quesne and Lewis (1953) maintained an oral or intravenous intake of 4 litres of water per twenty-four hours and, in some patients, also 10 g. of sodium chloride (160–170 m.eq. of sodium) or 200 m.eq. of potassium per twenty-four hours. In spite of these unusually high intakes of water and minerals, Le Quesne and Lewis found that a period of oliguria invariably followed operations such as partial gastrectomy; but, because of the coincident retention of water, there were also dilution of the extracellular fluid and a gain in weight. It is interesting that the oliguria may be as intense in a patient who has been loaded with water as in one who has been deprived of water. If this oliguria is related to an increased output of pituitary antidiuretic hormone (Dudley et al. 1954), the stimulus responsible for this secretion appears to be indifferent to the state of hydration of the body immediately after injury, since injury leads to a response which persists despite the administration of water. This conception is of great clinical importance; in the patient who does not receive any water antidiuresis leads to close conservation of water, but in the patient to whom 4 litres of hypotonic fluid is administered a similar antidiuresis leads to retention of water which temporarily the body cannot excrete. In the present series antidiuresis was most intense during the first forty-eight hours but lasted to various degrees for six days or more after the operation.

The consistent pattern of urinary excretion of sodium in the present patients conforms with some earlier descriptions.

The close renal conservation of sodium after injury in the absence of any intake of sodium for seventy-two hours and when the body is losing water indicates that the post-operative conservation of sodium is not due to water-loading as was suggested by Le Quesne and Lewis (1953). Such conservation maintains the total amount of sodium in the body and therefore the volume of the extracellular fluid at levels compatible with survival when the intake of sodium has stopped. If such conservation is part of the normal biological response to injury, it is not surprising that it persists despite the administration of water or of minerals after operation. In this series evidence was not obtained of the "early and late sodium retention" which Le Quesne and Lewis (1953) described during the adminstration of water and sodium to surgical patients. The concentration of sodium in the urine varied directly with the total amount excreted; usually both decreased and increased together during the first ten days. The specific gravity of the urine was not related to the concentration of sodium, potassium, or nitrogen in the urine. Rather, as fig. 1 shows, the excretion of these three elements follows a pattern which spreads the urinary osmotic load. There does not appear to be any reason for changing the earlier conclusions that the retention of sodium lasts up to a week after partial gastrectomy (Wilkinson et al. 1949), even when sodium is withheld for seventy-two hours and when water is withheld for forty-eight hours.

Blixenkrone-Møller (1949) concluded that the post-operative urinary excretion of potassium was smaller in patients to whom adequate volumes of fluid were administered than in patients whose intake of fluid was restricted. It was surprising to find that the present results did not confirm his observations. The urinary excretion of potassium in the present patients has been compared with that of 5 patients previously reported (Wilkinson et al. 1950a) to whom "adequate" volumes of glucose solution or of 0·9% saline solution were administered after partial gastrectomy. In the earlier series of hydrated patients the largest urinary excretion of potassium was 65–121 m.eq.; in the present series it was 72·5–119·0 m.eq. except in case 6, who excreted a maximum of 151 m.eq. in twenty-four hours.

The present patients began to lose weight during the operation, and there was no period of gain such as is usually found in patients who receive fluid by mouth or by infusion. It is fairly certain that such a gain in weight is the result of retention of part of the administered fluid, but this does not appear to affect the amount of weight lost at the end of ten to fourteen days. Changes in body-weight are difficult to interpret, chiefly because any alteration may be due to several normal processes—e.g., insensible loss of water, excretion of urine, and katabolism of protein and fat—moreover in one individual after operation the contributions of each of these factors to the total change may vary greatly from day to day.

During complete starvation the oxidation of fat is essential to provide sufficient energy to maintain life; but the oxidation of 100 g. of fat leads to the formation of 107 g. of water as well as the provision of 800 calories and leads to little change in body-weight. Although the katabolism of 100 g. of protein releases only 79 g. of

TABLE V—AVERAGE DAILY LOSS OF WEIGHT, AND OUTPUT AND INTAKE OF FLUID

	24-hr. periods after operation			Total
	1	2	3	
Weight loss (g.)	2644	1418	447	4509
Urine (ml.)	607	541	745	1893
Aspiration (ml.)	166	..	..	166
Intake (ml.)	..	..	600	600
Weight loss + intake − output ..	1871	877	302	3050

water, even this reduction is not enough to explain the large changes in weight after operation. Loss of water is likely to be the main factor in any sudden loss of weight, and some indication of the source of the lost water may be given by measurements of coincident losses of sodium and potassium.

In the present patients for forty-eight hours after the operation nothing was added to the body, and the loss of weight during this period was a direct measure of the loss of body components.

In table v the average changes in body-weight, the volume of urine and of gastric aspirations, and the urinary outputs of sodium and potassium are shown for the first three days after the operation. The difference between the total loss of weight and the intake of water, and the water lost as urine and gastric aspirations amounted to 3·05 kg. in seventy-two hours. This unexplained fraction of the weight lost was largest in the first twenty-four hours (1·871 kg.) and decreased to 0·877 kg. in the second, and was only 0·302 kg. in the third. The insensible loss of water by diffusion through the skin and as water vapour in the expired air offers the most likely explanation of this otherwise unexplained loss of weight; sweating may have taken place but was not noticeable in any of these patients. Wiley and Newburgh (1931) concluded that, within a wide range of environmental conditions and energy consumption, and even after dehydration equivalent to 6% of the initial weight, the insensible part of the daily extrarenal loss of water dissipated 25% of the total daily production of heat by the body.

Cuthbertson (1945) suggested that the surgical patient at rest in bed probably had a basal requirement of 2100 calories a day; this would imply an insensible loss of 900 ml. of water a day. The energy consumption of an adult man during the immediate postoperative period has not been measured; but, if the large unexplained loss of 1·871 kg. of body-weight in the first twenty-four hours is due to an increase of insensible loss of water, this suggests that the production of heat by the body may increase by 50% or more above the basal level during the first twenty-four hours. This would imply a consumption of at least 3200 calories a day and the oxidation of 300–400 g. of fat. This hypothesis is in good accord with the observation (Cuthbertson 1936) that, during the first twelve days after a fracture, the respiratory quotient varies between 0·76 and 0·85.

In addition, Le Quesne and Lewis (1953) found that, on an intake of 4 litres of water in the first twenty-four hours after an operation, the average volume of urine of their patients was 1115 ml. and their weight increased by 1·5 kg. If the remaining 1·385 kg. represents insensible loss of water it is a good deal smaller than the figure of 1·871 kg. derived from the present observations.

Table VI shows the average urinary outputs of sodium and potassium and the volumes of extracellular and intracellular fluid in which these quantities of sodium and potassium would be contained. During seventy-two hours 120 m.eq. of sodium and 220 m.eq. of potassium were lost in the urine. Provided that these losses were accompanied by the loss of an equivalent amount of water from the body by any route, this would indicate the loss of 859 ml. of extracellular fluid and 1973 ml. of intracellular fluid. In this way 2·832 kg. of water might be provided towards the total loss of weight of 4·509 kg., leaving 1·677 kg. less the intake of 600 ml. in the third period—i.e., 1·077 kg. unexplained.

After the initial rapid and large loss of weight there is usually little change until the slow increase begins about the eighth day. From the fourth to the eighth day large changes are taking place in the body, but their bearing on the body-weight cannot yet be individually followed with any certainty.

The apparently large increase of insensible loss of water during the first twenty-four hours after operation reflects a proportionately large increase in energy consumption. If the means by which this is brought about are obscure, one of its clinical manifestations, "the traumatic fever," has long been recognised as an invariable sequel to injury even in the absence of infection. In thirsting patients the increased rate of insensible loss of water is accompanied by loss of weight. At first the body loses water alone; but, unlike thirst in healthy people whose urinary loss of potassium is unabated but not increased (Nadal et al. 1941), in the postoperative patient there is an early and large increase in the urinary excretion of potassium. If insensible loss of water at the body surface leads to a local increase in the concentration of extracellular fluid, this in turn, by causing the transfer of water out of the cells, spreads the disturbance more widely over the whole mass of body-water. When sufficient water has been lost from the intracellular fluid in this manner, it is not hard to imagine that the increased intracellular tonicity is reduced by the outward transfer of potassium and phosphate and their rapid excretion in the urine (Wilkinson et al. 1950b). It is not uncommon for more potassium than is normally contained in the whole of the extracellular fluid to be mobilised from cells in a few hours, and the rapid excretion of this potassium in the urine is essential if its extracellular concentration is to be maintained within normal limits. The stimulus to the initial increase in energy consumption is unknown, but there is now evidence that the increased excretion of potassium and close renal conservation of sodium may be largely influenced by aldosterone (Llaurado 1955). Even when urine is collected as often as every six hours after operation, it is difficult to judge whether the diuresis of potassium precedes the conservation of sodium, but it is conceivable that the tendency for the concentration of the extracellular potassium to increase as the result of a shift of potassium from the cells, as much as the cessation of intake of sodium, may be the stimulus to an increased production of aldosterone (Laragh and Stoerk 1955).

The coincidence of rapid loss of weight, increased urinary excretion of potassium and thirst, as well as the clinical features of the thirst, indicates that during the first forty-eight hours after injury there is severe intracellular dehydration as a sequel to the insensible loss of water. Since thirst persists despite the intravenous or rectal administration of water, there appears to be some obstacle to the replacement of the lost water in the cells, even when abundant water is made available. Perhaps this loss of water is the initial feature of the cellular

TABLE VI—AVERAGE DAILY OUTPUT OF SODIUM AND POTASSIUM

	24-hr. periods after operation			Total
	1	2	3	
Urinary sodium (m.eq.)	75	30	15	120
Extracellular fluid (ml.)	536	215	108	859
Urinary potassium (m.eq.)	90	80	50	220
Intracellular fluid (ml.)	804	714	455	1973
Daily total fluid (ml.)	1340	929	563	2832

katabolism which goes on to the liberation of potassium and nitrogen.

The present observations have the following clinical applications:

(1) The specific alteration in renal function after injury leads to the renal conservation of sodium and the urinary excretion of potassium at a concentration which may exceed that in intracellular fluid. A small output of urine of high specific gravity containing much potassium and little sodium is not only compatible with survival but also appears to be the normal sequel to a major surgical operation or to other severe injury and does not call for either intravenous or rectal administration of fluid to induce diuresis.

(2) The large urinary excretion of potassium as part of the normal response to severe injury is readily tolerated by well-nourished patients and does not necessitate the replacement of potassium salts by intravenous infusion. On the contrary, during the first forty-eight hours after injury, such infusions are not only dangerous and ill advised but also, because of the tendency to transfer potassium from intracellular to extracellular fluid, are unlikely to be of any value.

(3) The renal conservation of sodium prevents any large loss of sodium in the urine. Therefore, provided large volumes of gastro-intestinal secretion are not lost by gastric aspiration, diarrhœa, or a fistula, there is seldom any need to administer sodium salts during the first week after operation.

(4) The restriction of drinking for forty-eight hours after gastrectomy reduces the volume of fluid to be removed from the stomach by aspiration. Thirst is as effectively relieved by washing out the mouth with ice-cold water as by drinking, and thus stimulation of secretion in the gastric remnant by swallowed water is avoided.

Summary

The effects of stopping the intake of water as well as of food and minerals for forty-eight hours after partial gastrectomy have been observed and are compared with previous observations on patients whose intake was not so restricted.

The urinary excretion of sodium was reduced from more than 100 m.eq. per twenty-four hours before operation to less than 75 m.eq. during the first twenty-four hours after operation, below 50 m.eq. in the second, and less than 25 m.eq. in the third, fourth, and fifth. Thereafter there was wide variation in the urinary excretion of sodium.

The urinary excretion of potassium increased from 25–50 m.eq. per twenty-four hours before operation to 75–125 m.eq. during the first and second twenty-four hours after operation, 25–75 m.eq. in the third and fourth, and 25–50 m.eq. in the fifth and subsequent.

After operation there was a large loss of body-weight which was greatest during the first forty-eight hours and was 2·1–11·3% of the initial body-weight.

Variations from the general pattern and possible explanations for the changes observed and their bearing on the normal bodily response to injury and post-operative treatment are discussed.

I am indebted to the patients who coöperated in this investigation, Sister J. A. S. Milne and her staff for assistance in the wards, and Miss Edna Simpson and Mr. Gordon Shewan for technical assistance.

REFERENCES

Benedict, F. G. (1915) A Study of Prolonged Fasting. Washington.
Blixenkrone-Møller, N. (1949) *Acta chir. scand.* **97**, 300.
Cuthbertson, D. P. (1936) *Brit. J. Surg.* **23**, 505.
— (1945) *Brit. med. Bull.* **3**, 96.
Dudley, H. F., Boling, E. A., Le Quesne, L. P., Moore, F. D. (1954) *Ann. Surg.* **140**, 354.
Gamble, J. L. (1954) Chemical Anatomy, Physiology and Pathology of Extracellular Fluid. 6th ed., Cambridge, Mass.
Laragh, J. H., Stoerk, H. C. (1955) *J. clin. Invest.* **34**, 913.
Le Quesne, L. P., Lewis, A. A. G. (1953) *Lancet*, i, 153.
Llaurado, J. G. (1955) *Ibid*, i, 1295.
McCance, R. A., Widdowson, E. M. (1946) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 235, 2nd ed.
Nadal, J. W., Pedersen, S., Maddock, W. G. (1941) *J. clin. Invest.* **20**, 691.
Wiley, F. H., Newburgh, L. H. (1931) *Ibid*, **10**, 689.
Wilkinson, A. W., Billing, B. H., Nagy, G., Stewart, C. P. (1949) *Lancet*, i, 640.
— — — — (1950a) *Ibid*, i, 533.
— — — — (1950b) *Ibid*, ii, 135.
— — — — (1951) *Ibid*, i, 315.

THE USE OF ANDROGENS IN THE FEMALE *

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"No physiological genital role of androgens in the female has been described and none seems likely. In view of the defeminizing or contrasexual alterations which androgen therapy produces in woman, it seems likely that gynecic functions occur despite woman's androgen moiety rather than by virtue of it." (Hamblen 1947.)

"The androgens are . . . as important in the economy of the female as are the œstrogens." (Loeser 1951.)

PRESUMABLY the truth lies somewhere between these extreme views. At all events in the treatment of women androgens may have a potential value, the possibilities being as follows:

(1) For their contra-œstrogen effects—e.g., in the treatment of various menstrual disorders and so-called fibrocystic mastopathy and in the palliation of carcinoma of the breast.

(2) For their alleged œstrogen synergistic effects—e.g., in treatment of the climacteric syndrome.

(3) For their effect in increasing libido where this is deficient.

(4) For their nitrogen anabolic effect—e.g., in increasing the weight in anorexia nervosa and other allied states, and the stimulation of linear growth in children of deficient stature.

The ideal androgen for these purposes would be one with maximal œstrogen antagonistic or synergistic, and nitrogen anabolic effect, and minimal virilising effect. The search for such a substance has led to the introduction of various androgen analogues.

I report here my experiences with methyl testosterone, methyl androstanediol, and androstalone (methyl androstane 3-one-17-ol) in 83 patients aged from 4 years 11 months to 55. In all the cases oral treatment was used (the well-known "Greenblatt medical curettage," brought about by intramuscular injections of testosterone propionate and progesterone [Greenblatt 1947], is very reliable and does not require further consideration).

Regular Menorrhagia

In this group the complaint is that, though the periods are regular, the blood-loss is excessive and the flow often unduly prolonged. The 32 patients were aged 20–50 (average 35·5).

9 patients were treated with methyl testosterone 5 mg. b.d. sublingually, starting a week before the expected onset of the period and continuing until the third day of bleeding. The response was good in 2 patients, of whom 1 also experienced amelioration of premenstrual symptoms, but the other later did not respond. 4 patients showed a slight response, but 1 of them complained of abdominal discomfort, and 1 other of facial hirsuties after three cycles of treatment. The remaining 3 patients did not respond but later showed some response to treatment with methyl testosterone with ethisterone.

This combined treatment consisted of methyl testosterone 5 mg. b.d. and ethisterone 15 mg. b.d.† and was used, in the same way as the methyl-testosterone treatment mentioned above, on 22 patients. Of these, 7 responded well (1 had previously failed with methyl testosterone alone); 4 showed some, albeit an inadequate, response (1 of these later showed spontaneous improve-

* Paper read at a joint symposium of the Society for Endocrinology and the section of endocrinology, Royal Society of Medicine, on Selected Aspects of the Practice of Hormone Administration in Animals and Man on Feb. 22, 1956.

† A tablet combining these substances in the above dosage is available as 'Androgeston' (British Schering).

ment); 5 showed no response; and 6, all with strong emotional factors, also did not respond. With the exclusion of these obviously "emotional menorrhagias," the combined treatment had some effect in 12 of 17 patients, compared with 6 of 9 treated with methyl testosterone alone, and a good effect in relatively more patients (7 of 17 against 2 of 9).

8 patients were treated with androstalone in combination with ethisterone given as described above. In 1 of them the dose of androstalone was 10 mg. daily and the response was less good than that with methyl testosterone and ethisterone. 5 patients received androstalone 50 mg. daily with ethisterone: in 2 of them the effect was good (1 of these also gave a good response to methyl testosterone and ethisterone but was unaffected by androstalone 50 mg. daily alone); in 2 there was a partial response (in 1 of these treatment increased acne on the back); and the other 1 did not respond. 2 patients received androstalone 25 mg. daily with ethisterone, as described above: 1 of them responded well, and the other partially, doing no better with double the daily dose of androstalone. Thus, of the 7 patients receiving combined treatment with androstalone 25 or 50 mg. daily 6 showed some response and 3 a good one.

Other Menstrual Disorders

This group comprised 12 patients aged 23–42 (average 30·8), who complained of the following menstrual disorders: irregular uterine bleeding (6 patients); "premenstrual dribbling" (2 patients), in which a bloody discharge precedes the period by two to fourteen days and continues until the onset of the period proper; other intermenstrual bleeding (2 patients); and climacteric menorrhagia (2 patients). Organic causes had, of course, been excluded in all the cases.

Irregular Uterine Bleeding.—1 patient, with strong emotional accompaniments, received methyl testosterone 10 mg. daily for two months with no benefit. 2 similar patients received androstalone 50 mg. daily for two months with equal lack of benefit; 1 of these had also not responded to methyl testosterone. 1 other patient, who also complained of intermenstrual pain, derived no benefit from methyl testosterone 30 mg. daily for two months. 2 others were treated with androgen and ethisterone in combination: 1 received androstalone 25 mg. and ethisterone 30 mg. with good effect, and the other methyl testosterone 10 mg. with ethisterone with slight effect. Treatment of this 2nd patient produced depression and abdominal distension.

"*Premenstrual dribbling*" usually reponds well to ethisterone alone. 2 patients were tried on androstalone 25 mg. daily: in 1 the duration of bleeding was reduced from ten to fourteen days to seven days, with an accompanying decrease in the amount of loss; she relapsed on stopping treatment and later responded to methyl testosterone and ethisterone. The other patient showed no response to androstalone 25 mg. daily but responded well to ethisterone 40 mg. daily given from the fifteenth day of the cycle for ten days.

Intermenstrual Bleeding.—2 patients with this complaint received methyl testosterone 15 mg. daily; 1 showed no response, and the other, who also complained of abdominal pain, responded well as regards the bleeding but less well as regards the pain.

Climacteric Menorrhagia.—Androstalone 25 mg. daily was without effect in 1 patient. 1 other responded well to methyl testosterone and ethisterone but relapsed when the treatment was stopped. Resumption of treatment gave satisfactory results for fourteen months, when it was changed to androstalone 50 mg. daily with ethisterone. This gave even better results and was continued for six months, after which there was no relapse in the subsequent six months without treatment.

Dysmenorrhœa

Androgens were tried in 5 patients, aged 19–29, with this complaint.

2 patients were treated with methyl testosterone 15 mg. daily from the seventh to the thirteenth day of the cycle by the method for which good results were claimed by Filler (1950). 1 was unaffected by the treatment, and the other received minimal benefit. Methyl testosterone 10 mg. daily given for a week before the onset of the menstrual period was without effect on another patient.

Androstalone 25 mg. daily, given to a patient with fibrocystic mastopathy, considerably decreased her dysmenorrhœa. Another patient, in whom œstrogen treatment had caused nausea and vomiting, was treated with androstalone 50 mg. daily, starting a few days before the onset of each menstrual period, with moderately good results. After ten months of this therapy she no longer complained of symptoms sufficiently serious to require treatment.

Fibrocystic Mastopathy

7 patients, aged 20–44 (average 33·3), complained of breast pain, either continuous or intermittent, and having the typical palpatory findings of so-called fibrocystic mastopathy. A further patient, who complained of intermittent pain in the left breast but had no abnormal physical signs, received no benefit from treatment with androstalone 25 mg. daily and was considered to have intercostal myalgia, not fibrocystic mastopathy.

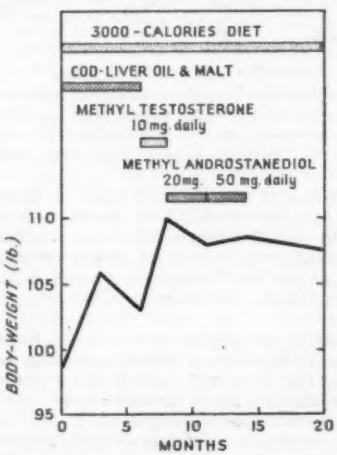

Fig. 1—Body-weight in case 2.

Androstalone was given to 3 patients with the typical physical findings. 25 mg. daily gave excellent results in 2 patients, for both of whom 25 mg. on alternate days proved less effective. One of these 2 patients (aged 22) received 25 mg. daily for four months and, although the duration of her menstrual periods decreased from seven days to just over a day, she nevertheless conceived while under treatment. The remaining patient obtained complete relief from 10 mg. daily for a month followed by 5 mg. daily for a further two months; the symptoms did not return when the treatment was stopped.

5 patients all benefited from treatment with methyl testosterone either 5 or 10 mg. daily. In 1 of these patients 5 mg. proved definitely less effective than androstalone 25 mg. daily. In 1 other patient relief lasted six months or more after treatment for a month or so at a time. A further patient complained of discharge from one nipple, in addition to the pain; after treatment for a month, during which time the pain disappeared though the discharge persisted, she remained free from pain for a further three months.

Deficiency of Libido

There were 5 patients, aged 22–37, with deficiency of libido. 1 of them was treated with androstalone 50 mg. daily and with methyl testosterone 10 mg. daily for menstrual irregularities; neither substance increased her

deficient libido. The remaining 4 patients all experienced an increase in libido on treatment with methyl testosterone either 5 or 10 mg. daily. 1 of these patients merits further notice:

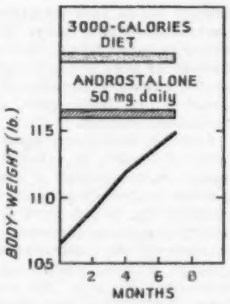

Fig. 2—Body-weight in case 3.

Case 1, aged 37, complained of complete loss of libido following hysterectomy and oöphorectomy. The position was complicated by the existence of a strong conflict between her and her husband. In spite of this methyl testosterone 10 mg. daily increased her libido within a few days, but after a month her libido decreased again although treatment was being continued. Resumption of treatment with 15 mg. daily after its omission for a month led to a prompt return of libido, but, after four months' treatment, for three weeks out of every four she developed acne, and further treatment was abandoned.

Climacteric Symptoms

Only a proportion of patients with climacteric symptoms require hormonal treatment, and for most of these œstrogens in small dosage and in interrupted courses usually provide satisfactory relief. Most of the "difficult" patients are those who have had prolonged œstrogen therapy in excessive dosage and therefore experience œstrogen-deprivation symptoms whenever treatment is stopped. For these androgen-œstrogen mixtures may prove very useful, but in my opinion such mixtures are seldom superior to œstrogen alone in uncomplicated cases. The results on a small group of patients aged 37–55 treated with various hormone mixtures are as follows:

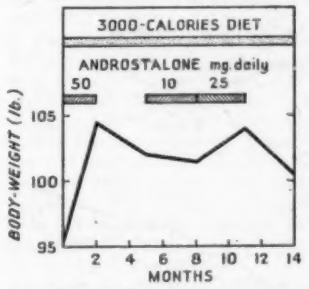

Fig. 3—Body-weight in case 4.

3 patients received 'Mixogen'‡: 1, for whom œstrogens alone had been unsatisfactory, was well controlled on one tablet daily and less; another obtained much less benefit from one or two tablets daily than from stilbœstrol 0·2 mg. daily; and the 3rd, who had had little benefit from stilbœstrol 0·2 mg. daily with phenobarbitone, was very well controlled with mixogen two tablets daily (omitted for fourteen days at the end of every four weeks), but after eight months she complained of increased growth of facial hair.

A combined tablet, containing ethinyl œstradiol 0·02 mg., ethisterone 20 mg., and methyl testosterone 8 mg.§ was used for 4 patients, who took one tablet on alternate days. 1 of these was the last of the above-mentioned patients; she obtained no benefit. Another was the 2nd of those patients who had not benefited from mixogen; for her the triple combination proved very effective. It was successful for a 3rd patient, the dose being reduced to one tablet every fourth day after six months and stopped altogether three months later, with no return of symptoms. The 4th patient, aged 37, had had bilateral salpingo-oöphorectomy for endometriosis; although the triple combination abolished her depression but was less effective in preventing hot flushes, after a year's treatment she remained essentially free from symptoms.

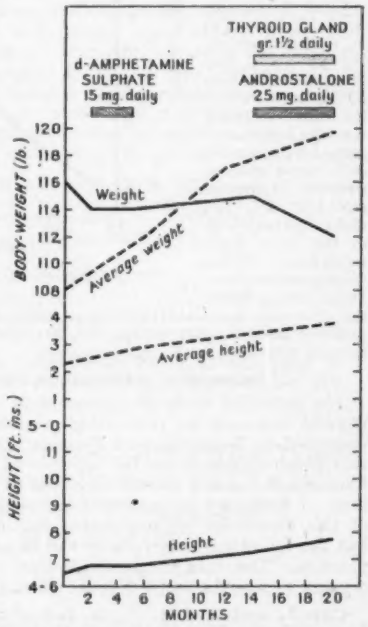

Fig. 5—Body-weight and height in case 10 compared with averages.

Anorexia Nervosa and Other States of Emaciation

There were 6 patients, aged 19–36, in this group. All were placed on a 3000-calorie diet (which none of course followed properly) and received androgens for their nitrogen anabolic effects in addition. 1 patient on androstalone 50 mg. daily gained no weight; another, on androstalone 25 mg. daily, gained 2¾ lb. in two months, her weight remaining stationary on stopping the androgen; and a 3rd gained ¾ lb. in three months while taking methyl testosterone 30 mg. and dried thyroid gland gr. 1½ daily, but no further weight in the next four months on androstalone 25 mg. and dried thyroid gland gr. 2 daily. The results in the 3 other patients are shown in figs. 1–3.

Case 2 (fig. 1), aged 36 and 5 ft. 5 in. tall, whose initial weight was 98½ lb., was put on cod-liver oil and malt in addition to the 3000-calorie diet. She gained 7½ lb. in the first three months, only to lose 3 lb. in the next three months. She was then given methyl testosterone 10 mg. daily and gained 7 lb. in the next two months. On methyl androstanediol 20 mg. daily she lost 2 lb. in the next three months but gained ½ lb. in the following three months on the increased dose of 50 mg. daily. She lost 1 lb. in the following six months while taking no hormones.

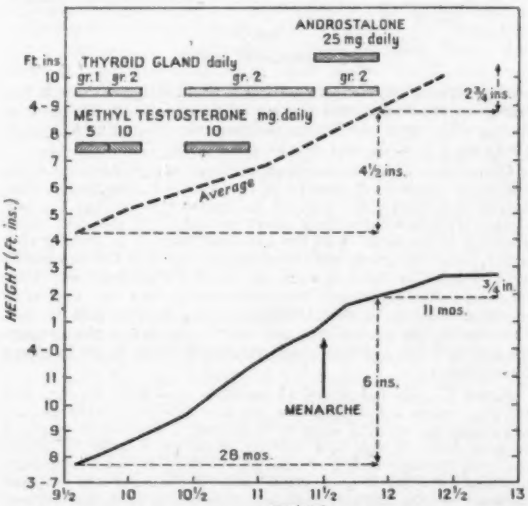

Fig. 4—Height in case 8 compared with average height.

‡ Each tablet of mixogen (Organon) contains ethinyl œstradiol 0·004 mg. and methyl testosterone 3·6 mg.

§ Kindly supplied by Dr. A. Gremeaux, of Roussel Laboratories Ltd.

Case 3, aged 19, 5 ft. 4$^3/_4$ in. tall, and weighing 106$^1/_2$ lb., complained of hypomastia, which was merely part of a general state of emaciation. On a 3000-calorie diet with androstalone 50 mg. daily she gained 8$^1/_2$ lb. in seven months (fig. 2).

Case 4 (fig. 3), aged 25, 5 ft. 7$^1/_2$ in. tall, and weighing 95$^1/_2$ lb., was given androstalone 50 mg. daily for two months, during which time she gained 9 lb. In the next three months without hormone she lost 2$^1/_2$ lb., and a further $^1/_2$ lb. in the next three months while taking androstalone 10 mg. daily. When the dose was increased to 25 mg. daily, she gained 2$^1/_2$ lb. in three months, only to lose 3$^1/_2$ lb. in the following three months when not taking the hormone.

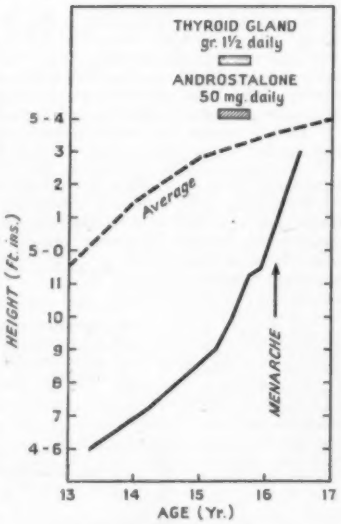

Fig. 6—Height in case 11.

Promotion of Growth in Children

The potential value of androgens in combination with thyroid hormone for promoting growth in children was described by Escamilla and Bennett (1951), who showed this combination to be far superior to purified growth-hormone in causing growth in a case of pituitary infantilism. I have now accumulated a considerable experience of this treatment for undersized children of either sex, but the following observations will be confined to female patients. The data are available from 9 girls, aged from 4 years 11 months to 16$^1/_2$ years when first seen.

Case 5, aged 16, 4 ft. 9$^1/_2$ in. tall, of normal radiological bone age, grew $^1/_2$ in. in five months while under treatment with methyl testosterone 10 mg. and thyroid gland gr. 1$^1/_2$ daily. Her epiphyses had fused by this time, and she did not grow any more.

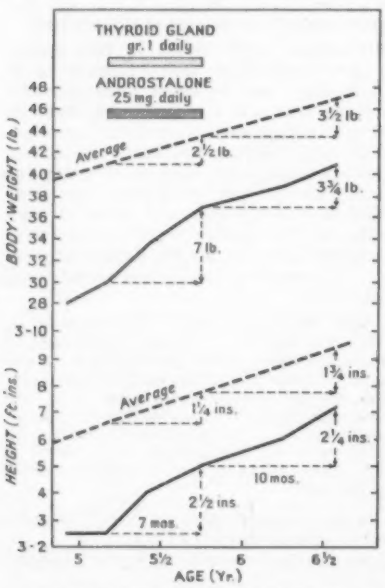

Fig. 7—Body-weight and height in case 12.

Case 6, aged 16$^1/_2$, 4 ft. 6 in. tall, also of normal bone age, showed no growth in two months on thyroid gland gr. 1$^1/_2$ and methyl testosterone 5 mg. daily, grew $^1/_4$ in. in the next three months on the same dosage of thyroid gland with methyl testosterone 10 mg. daily, and grew no more in the following year without treatment.

Case 7, aged 14 and 4 ft. 3$^1/_2$ in. tall, grew 1 in. in four months on methyl testosterone 5 mg. and thyroid gland gr. 1 daily. In the next three months, on methyl androstanediol 20 mg. and thyroid gland gr. 1 daily there was no further growth; nor was there any during a further period of treatment with methyl testosterone 5 mg. and thyroid gland gr. 2 daily, even though her radiological bone age remained normal.

Case 8, her sister, aged 9 years 7 months, was also very short (3 ft. 7$^3/_4$ in., about 8$^1/_4$ in. below the average for her age). Over a period of intermittent treatment with thyroid, methyl testosterone and androstalone lasting twenty-eight months (fig. 4) she grew 6 in. in height (expected increment 4$^1/_2$ in.), and her menarche came on at the age of 11$^1/_2$ years in spite of the androgen therapy. During the next eleven months without treatment she grew only $^3/_4$ in. (expected increment 2$^3/_4$ in.). She developed rather severe acne on her face after treatment with methyl testosterone 5 mg. daily for three months, followed by 10 mg. daily for three months, then a gap of four months without androgen, followed by 10 mg. daily for six months. The acne persisted in spite of the withdrawal of androgen therapy.

Case 9, aged 14 years 8 months, 4 ft. 10$^1/_4$ in. tall, of normal bone age, had not grown at all in nine months without treatment. During three months while taking androstalone 50 mg. daily she grew $^3/_4$ in., but she did not grow any more in the next three months while continuing treatment and she developed amenorrhœa for six months.

Case 10, aged 14$^1/_2$, weighed 116 lb. (9$^1/_2$ lb. above the average for her age) in spite of being only 4 ft. 6$^1/_2$ in. tall (7$^3/_4$ in. below the average). Dietary measures had little effect on her weight beyond preventing it from rising although she was growing slowly, and she actually lost 3 lb. in six months during which she was taking androstalone 25 mg. and thyroid gland gr. 1$^1/_2$ daily and in which she grew $^1/_2$ in. (fig. 5).

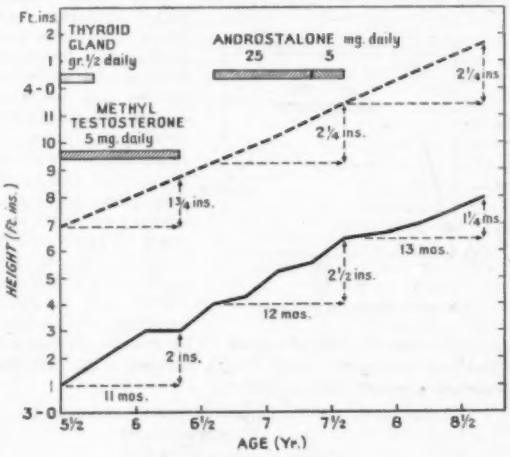

Fig. 8—Height in case 13.

Case 11.—Fig. 6 shows the somewhat surprising course of a girl aged 15 years 3 months at the start of treatment. Her height was then 4 ft. 9 in. (6 in. below the average for her age). Over the preceding seventeen months she had been growing at no more than the expected rate (3 in. during this time). She was given androstalone 50 mg. and thyroid gland gr. 1$^1/_2$ daily for three months, in which she grew 2$^1/_4$ in. This increased rate of growth was maintained over the next nine months without further treatment, and at the end of this time her height (5 ft. 3 in.) was only $^3/_4$ in. below the average for her age (16$^1/_2$ years). Her menarche came on at 16 years 2 months.

Case 12, aged 4 years 11 months, was 3 ft. 2$^1/_2$ in. tall (3$^3/_4$ in. below the average for her age) (fig. 7). There was no growth in six months without treatment; she was then given androstalone 25 mg. and thyroid gland gr. 1 daily for seven months, during which time she grew 2$^1/_2$ in. (1$^1/_4$ in. expected) and gained 7 lb. (2$^1/_2$ lb. expected). Treatment was stopped because slight, though definite, enlargement of the clitoris had developed; there was no hirsutism or other evidence of virilisation. In the next ten months she grew 2$^1/_4$ in. (1$^3/_4$ in. expected) and gained 3$^3/_4$ lb. (3$^1/_2$ lb. expected). This suggests

that, as in case 11, the course of treatment had had a trigger effect on growth, which continued at an enhanced rate even after the cessation of therapy.

Case 13, aged 5 years 5 months, was 3 ft. 1 in. tall (6 in. below the average for her age) (fig. 8). During eleven months' treatment with methyl testosterone 5 mg. daily and thyroid gland gr. $^1/_2$ daily for the first three months (thyroid therapy was stopped at this point because it appeared to cause undue restlessness), she grew 2 in. ($1^3/_4$ in. expected). Treatment was interrupted for three months (during which time she grew 1 in.) and then resumed with androstalone 25 mg. daily for nine months and 5 mg. daily for three further months. During these twelve months she grew $2^1/_2$ in. ($2^1/_4$ in. expected). In the next thirteen months without treatment she grew only $1^1/_4$ in. ($2^1/_4$ in. expected).

Conclusions

The observations reported here were made with the deliberate intention of attempting to assess various oral androgen preparations in a rather wide group of disorders in the female. Consequently the number of patients with any one disorder who have been treated is relatively small, and it would therefore be unwise to draw other than tentative conclusions. However, there seems to be little doubt that androgens may be of value in quite a number of disorders, though equally doubtless is the fact that a favourable response cannot be anticipated in every case.

Of the *menorrhagias* those clearly due to emotional causes (which may well be the majority) are very unlikely to respond to hormonal treatment of any kind. Where the emotional element can be ruled out, or is relatively unimportant, androgens alone have proved to be of little value, though the combination of methyl testosterone or androstalone and ethisterone has helped numerous patients. The results in the treatment of irregular uterine bleeding are unimpressive. Some patients with *dysmenorrhœa* may respond favourably to androgens; in the small series reported androstalone seemed to be the most promising. The discomfort of *fibrocystic mastopathy* may rather confidently be expected to respond to androgens, good results having been obtained with methyl testosterone and androstalone.

Increase in *libido* may follow treatment with methyl testosterone, but such a response cannot confidently be predicted in women complaining of frigidity. In the dosage of 50 mg. daily androstalone has not affected libido.

The superiority of androgen-œstrogen preparations over œstrogens alone in the treatment of the *climacteric syndrome* is not invariable, the reverse being true for some patients. Nevertheless these combinations do prove particularly helpful in some cases.

For *increasing the weight* of much-underweight patients androgens prove helpful in some cases. In the patients studied the benefits of treatment may have been due to an effect on appetite, possibly a consequence of increased nitrogen anabolism; it is unlikely that they were merely the consequence of retention of fluid. The limited observations suggest that methyl androstanediol, even in a dosage of 50 mg. daily, is of little value; that methyl testosterone 10 mg. daily may produce positive results; and that androstalone 25 or 50 mg. daily may also be effective.

The value of androgens, either alone or in combination with thyroid hormone, for the *promotion of growth in children* is unpredictable, but evidence has been adduced that it may be considerable in some cases. Sometimes it seems that a limited course of androgen therapy may have a trigger action, not only increasing the rate of growth at the time but also being followed by a sustained increase in growth-rate. It can be argued that, by causing earlier epiphyseal closure, androgen therapy, though increasing the growth-rate, may lead to earlier cessation of growth; hence the end-results are no better (and might be worse) than if no treatment had been given. My limited observations do not support such a view, but the possibility cannot be disregarded, and some nicety of judgment in giving and withholding the treatment must be exercised.

The obvious drawback to androgen therapy in the female is its potentially defeminising and virilising effects. In sufficient dosage it may cause amenorrhœa, hirsutism, acne, and deepening of the voice due to irreversible growth of the laryngeal cartilages. Some of these effects may be unavoidable in some patients, even with what might be regarded as therapeutic doses of any of the available androgens. It is therefore most important to be on the look-out for such undesirable effects of androgens used for the purposes considered here, even though they may be relatively unimportant when androgens are used to palliate carcinoma. Though evidence of the susceptibility of some people to methyl testosterone and to androstalone is presented (and susceptibility to methyl androstanediol is known to exist), it is also reassuring to know that conception and the menarche may take place while patients are undergoing effective androgen therapy.

My sincere thanks are due to Dr. A. Gremeaux, of Roussel Laboratories Ltd., for supplies of androstalone and of other hormone preparations; and to Mr. G. H. Wilkinson, of British Schering Ltd., for supplies of androgeston.

REFERENCES

Escamilla, R. F., Bennett, L. L. (1951) *J. clin. Endocrin.* **11**, 221.
Filler, W. (1950) *J. Amer. med. Ass.* **143**, 1235.
Greenblatt, R. B. (1947) Office Endocrinology. 3rd ed., Springfield, Ill.
Hamblen, E. C. (1947) Endocrinology of Women. Springfield, Ill.
Loeser, A. A. (1951) Gynécologie practique. Paris; vol. 2, p. 213.

INTRASPINAL EPIDERMOID TUMOURS (CHOLESTEATOMAS) IN PATIENTS TREATED FOR TUBERCULOUS MENINGITIS

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DERMOID and epidermoid tumours are rare in the central nervous system. They are variously called pearly tumours or *Perlgeschwülste* (Virchow), epidermoid teratomas, dermoid endotheliomas, and cholesteatomas. They are congenital.

The usual sites of dermoid and epidermoid tumours are the lumbosacral spinal canal, the middle ear, the vicinity of the pituitary gland, and between the tables of the skull. About 0·4% of intracranial tumours are pearly tumours (Rand and Reeves 1943, Kernohan and Sayers 1952). They grow exceedingly slowly and produce initial symptoms at an average age of 22 (Love and Kernohan 1936).

Recently we had, at the Children's Hospital of the University of Athens, occasion to study five pearly tumours located at the thoracolumbar spinal canal of five children, aged 7–12 years, who had been successfully treated for tuberculous meningitis from three to six years before the onset of symptoms due to the tumours.

The rare occurrence of such tumours in children and the apparent relationship between treated tuberculous meningitis and pearly tumours prompted us to report these cases.

Case-reports

Case 1.—A boy, aged 7, was admitted on May 15, 1955, with persistent pain in his back and both thighs. He had been treated for tuberculous meningitis at the age of 16 months and discharged four months later. At the age of 21 months he had had a relapse of tuberculous meningitis, which was successfully treated, and his health was restored to normal at the age of 2 years, except for left hemiplegia.

On examination he was well nourished and well developed but in moderate distress and pain. His reflexes were increased on the left side, and he had a positive left Babinski and clonus of the foot. Abdominal reflexes were normal. He gave a well-marked positive reaction to tuberculin 1 in 100,000. His urine and a peripheral blood-count were normal. Lumbar puncture produced cerebrospinal fluid (C.S.F.) under normal pressure and containing protein 1·5 g. per 100 ml., 3 cells per c.mm., and a normal amount of sugar. Cisternal puncture produced normal C.S.F. Radiography of the spinal column was normal, but myelography revealed that the cephalic circulation of the opaque substance was interrupted at the height of the second lumbar vertebra.

At operation an oval white tumour measuring 1·5 × 1 × 0·5 cm. was removed.

Pathological Report (*Dr. T. Gomatopoulos*).—The specimens were thin whitish masses of a pearly appearance and creamy consistence attached concentrically to one another. Numerous cholesterol crystals, keratinised material, and desquamated, mostly degenerated, epithelial cells were found. A small piece of epidermoid epithelium was also seen, including a three-layer squamous epithelium—i.e., stratum corneum, stratum germinativum, and stratum basale.

Diagnosis: pearly tumour (cholesteatoma).

Case 2.—A girl, aged 10 years, was admitted in October, 1955, because of pain in the back and difficulty in walking. At the age of 7 years she had been admitted to the Children's Hospital of the University of Athens with tuberculous meningitis. She had been successfully treated and discharged six months later with only minimal limping of the left leg. For the next three years she was said to have been normal. Three months before the present admission she started to complain of pain in the back radiating to the abdomen and aggravated by coughing, laughing, and sneezing. In addition her limping gait was much worse.

On admission the pain was severe, and she had partly lost control of her bladder. She was well nourished and well developed, and located her pain at the level of T9-T10. She had increased patellar and ankle reflexes on the left as well as a positive clonus and left Babinski. Her urine and a complete blood-count were normal. The erythrocyte-sedimentation rate was 24 mm. in the first hour and 48 mm. in the second hour (Westergren). Myelography revealed impairment of the circulation of the opaque substance at the level of T10.

At operation a white tumour of soft cheesy consistence was removed.

Pathological Report (*Dr. Gomatopoulos*).—The specimens were whitish and pearly in appearance and creamy in consistence. Numerous cholesterol crystals, keratinised material, and desquamated and degenerated epithelial cells were found. In one small piece a three-layer epidermoid epithelium was seen (stratum corneum, stratum granulosum-germinativum, and stratum basale). Some of the epithelial cells contained keratohyaline granules in their cytoplasm. A very small piece of arachnoid removed far from the tumour showed no pathological alterations.

Diagnosis: pearly tumour (cholesteatoma).

Case 3.—A girl, aged 12 years, was admitted on Jan. 12, 1956, with slight pain in the lumbar spine and both thighs. She had been treated at the age of 4 years for tuberculous meningitis, which relapsed after discharge from hospital (when she was 4½ years old). Retreatment was successful, and she was considered cured at the age of 5 years. For the next seven years she presented no symptoms. Two months before admission she started to complain of the lumbar pain, which was aggravated by bending, sneezing, and coughing. The pain was gradually getting worse, and she was admitted to hospital.

On admission she was well nourished and well developed, and in no distress. Her reflexes were active and equal. No abnormal signs were elicited. A blood-count showed red cells 3,800,000 per c.mm., white cells 8200 per c.mm. (differential count normal), and Hb 12·5 g. per 100 ml. Her urine and radiographs of her spinal column were normal. Lumbar puncture produced clear C.S.F. containing normal amounts of cells, protein, and sugar.

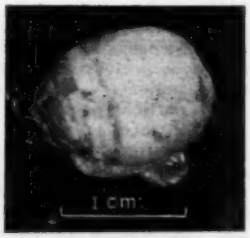
Operation.—On the basis of our previous experience with tuberculous meningitis and back pain myelography was done, and the circulation of the opaque substance was seen to be interrupted at the level of L3. At operation two intact tumours were removed, of which one measured 2·5 × 1·3 × 0·4 cm. and the other was as large as a small bean (1·5 × 1·0 cm.).

Pathological Report (*Dr. Gomatopoulos*).—One of the two small tumours weighed 3 g. and the other 0·5 g. Both were whitish, of pearly appearance, and of creamy consistence. Concentric luminæ were seen. Numerous cholesterol crystals, keratinised material, and desquamated and degenerated epithelial cells were found. A four-layer epidermoid epithelium was also seen (stratum corneum, stratum granulosum, stratum germinativum, and stratum basale). Under a higher power some of the epithelial cells were seen to contain keratohyaline granules while others were exfoliating and mixed with the amorphous creamy mass. The arachnoid attached to the tumour present microcellular reaction with lymphocytic infiltration.

Diagnosis: pearly tumours (cholesteatomas).

Case 4.—A boy, aged 9 years, was admitted on Feb. 11, 1956, because of severe back pain and inability to walk. His father had pulmonary tuberculosis. The patient was considered to be mentally retarded, presenting what was described at that times as "an obvious microcephaly." He walked at the age of 3 years, but he never spoke distinctly. At the age of 4 years he was successfully treated for tuberculous meningitis. Two months before the present admission he started to complain of back pain which was gradually getting worse and was aggravated on walking, running, and coughing.

On admission he was obviously retarded and spoke incoherently and pointed constantly to his lumbar spine. His patellar reflexes were increased and equal. His abdominal reflexes were normal. Physical examination was otherwise negative. Lumbar puncture produced C.S.F. containing protein 60 mg. per 100 ml., 105 cells per c.mm., and a normal amount of sugar. Cisternal puncture produced entirely normal C.S.F. The blood-cholesterol level was 180 mg. per 100 ml. Myelography suggested an interruption of the opaque substance at the level of L2.



One of the four pearly tumours in case 4.

At operation four white glistening closely situated tumours as large as beans or almonds were removed (see figure).

Pathological Report (*Prof. D. Elephtheriou*).—All four tumours were microscopically similar. They were cyst-like structures filled with a cheesy material and covered by a thin capsule. The cyst wall was made up of stratified squamous epithelium, with the basal layer towards the periphery of the cyst and the keratinised layer towards the lumen. The cysts contained keratin plates mixed with the amorphous creamy mass, within which numerous cholesterol crystals were present.

Diagnosis: pearly tumours (epidermoid cysts or cholesteatomas).

Case 5.—A boy, aged 9 years, was admitted on Feb. 25, 1956, with two years' history of severe back pain and difficulty in walking. He had been treated at the age of 2½ years for tuberculous meningitis and had been discharged in good health except for slight impairment of hearing. Five years after his attack of meningitis he started to complain of slight lumbar pain radiating to his right thigh. The pain was gradually getting worse and involved both legs, severely impairing his ability to walk.

On admission he was well nourished and well developed, bitterly complaining of thoracolumbar pain. He could not bend his back, and the pain was aggravated by sneezing, coughing, and walking. His tendon-reflexes were absent, and abdominal reflexes normal. Sensation was not impaired. Physical examination was otherwise negative. A blood-count and his urine were normal. His blood-cholesterol level was 175 mg. per 100 ml., and his C.S.F. was normal. Myelography revealed an interruption at the level of L2.

At operation a glistening white tumour as big as an almond was removed.

Pathological Report (Professor Elephtheriou and Dr. Gomatopoulos).—A small whitish tumour (measuring 2·5 × 1·5 × 0·8 cm.) and weighing 3·2 g. and of pearly appearance and creamy consistence. Histologically the tumour mass was made of parallel plates morphologically identical with cholesterol crystals. After staining with Sudan III the crystals remained colourless. Between the crystals many sudanophilic granules as well as degenerating polymorphs with cytoplasmic sudanophilic granules were present. Examination under polarised light confirmed the presence of the characteristic cholesterol crystals. A three-layer epidermoid epithelium was found in a small piece consisting of stratum corneum stratum granulosum, and stratum basale. Under a higher power some of the epithelial cells of the stratum corneum were seen to be degenerated and mixed with the amorphous creamy mass; and the arachnoid attached to it presented micro-cellular reaction with lymphocytes and plasmatocytes.

Diagnosis: pearly tumour (cholesteatoma).

Discussion

The intraspinal occurrence of epidermoid tumours is exceedingly rare.

Neither the name *tumeurs perlées* given to these neoplasms by Cruveilhier (1829) because of their highly refractile and nodular surface nor that of "cholesteatomas," as Müller (1838) called them, is satisfactory.

According to Munro and Wegner (1937) tumours of this type are histogenetically epidermoids or dermoids arising from ectopic fœtal epidermal-cell rests. On the other hand, it is well established that epidermoid cysts of the skin can be experimentally produced by implantation of epithelial cells by trauma, insect bites, &c.

It therefore seems possible that the pathogenesis of the tumours in the present cases is closely connected with tuberculous meningitis, thus constituting an unusual and probable complication of the treatment of tuberculous meningitis.

When streptomycin was introduced in the treatment of tuberculous meningitis, the C.S.F. was tapped usually in our hospital for from three to five months. Therefore it is probable that by the multiple punctures epithelial cells were implanted in the spinal canal.

We think that these cells develop gradually and slowly, forming a small cyst whose epithelium finally disintegrates and keratinises to form the typical cholesterol crystals.

Obviously this process is extremely slow, and thus the symptoms of the tumour's presence appeared in the present cases from three to seven years after the treatment of the meningitis.

Possibly the absence of a stylet from our spinal-tap needles enhances the probability of removing epithelial cells by the puncture and introducing them into the spinal canal.

Although the generally accepted theory is that these formations arise from displaced cutaneous ectodermal-cell inclusions, we nevertheless consider that, in our tuberculous-meningitis patients, it is more probable that epithelial cells were implanted than that the growth of already present cell inclusions was activated by local stimulation.

The incidence of cholesteatomas in treated cases of tuberculous meningitis is of course, unknown, but the number of the present cases discovered within a period of ten months leads us to suspect that it might be quite high, and that similar patients may be regarded and treated as cases of sciatica, back pain, or neuralgia of unknown origin.

We suggest that myelography should be considered in every such case of pain in the back that has been treated in the past for tuberculous meningitis.

Summary

Five cases of pearly tumour (cholesteatoma or epidermoid tumours) in patients aged 7–12 years are described.

All these children had been successfully treated three to seven years earlier for tuberculous meningitis.

We believe that the two conditions are closely related.

We think that repeated lumbar punctures may implant epithelial cells which in time form these tumours.

We hope that this report will alert physicians to the recognition of a curable condition arising as a complication of the treatment of tuberculous meningitis.

ADDENDUM

Since this paper was written we have studied a sixth case of cholesteatoma. The patient was a boy, aged 9 years, who had been treated for tuberculous meningitis six years before the onset of his present symptoms. On admission he complained of mild pain in both thighs. Myelography revealed interruption of the opaque substance at the level of the third lumbar vertebræ. At operation three white glistening tumours were removed; one measured 2·5 × 1·5 cm. and the other two were the size of peas. Pathological diagnosis: pearly tumour (cholesteatoma).

Grateful acknowledgment is made to Prof. D. Elephtheriou for valuable advice and assistance; Dr. T. Gomatopoulos for pathological studies in 4 cases; Dr. D. Yannakos for X-ray studies of all the patients; and Dr. V. Constantinides for referring case 1 to us.

REFERENCES

Cruveilhier, J. (1829) Anatomie pathologique du corps humain. Paris; vol. 1, p. 341.

Kernohan, J. W., Sayers, G. P. (1952) Tumors of the Central Nervous System. Washington, D.C.

Love, J. G., Kernohan, J. W. (1936) *J. Amer. med. Ass.* **107**, 1876.

Müller, J. (1838) Über den feinern Bau und die Formen der krankhaften Geschwülste. Berlin; vol. 1, p. 50.

Munro, D., Wegner, W. (1937) *New Engl. J. Med.* **216**, 273.

Rand, C. W., Reeves, D. L. (1943) *Arch. Surg.* **46**, 350.

ANAPHYLACTIC SHOCK DUE TO ORAL PENICILLIN

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ADVERSE reactions (some of them fatal) to procaine penicillin have been reported in cats and man and attributed to accidental intravenous injection causing pulmonary embolism (Batchelor et al. 1951, Bell 1954, Bell et al. 1954). If such a reaction develops during a course of procaine penicillin it is probably thus produced, but if it occurs at the first injection of a course, when there has been an interval long enough for a hypersensitive state to arise, it may be due to anaphylaxis, similar to that reported here in case 1 following oral penicillin.

Case-reports

Case 1.—A theatre sister, aged 28, took 300,000 units of benzathine penicillin ('Penidural') by mouth for a sore throat at 5 P.M. on Dec. 15, 1955. At 5.10 P.M. the inside of her mouth began to burn and the soles of her feet developed a burning itch. Within two or three minutes her hands were similarly affected, and this was followed by profuse sweating on the

forehead and face, spreading to the palms, legs, and body. At 5.15 P.M. she felt dizzy and had a slight headache. The itching changed to pain, and her hands became white, with the tips of her fingers blue. Her hands became semi-flexed, and pain prevented her from straightening them. Her face began to feel tight, and looking in a mirror she saw that it was taut, strained, and grey. Her facial muscles were stiff and hard. Her knees giving way, she lay on an examination couch and called for help. A nurse said later: "When I saw sister I was terrified—all her neck muscles were standing out, and she looked like an old woman." Drumming and singing began in the patient's ears, and she found it difficult to breathe. At 5.25 P.M. her pulse-rate was 140 and blood-pressure 100/80 mm. Hg. During the next ten minutes her pulse became slower and she began to feel a little better, but she was still very frightened and felt that she was dying. About this time a colicky pain started in her pelvis and lower abdomen. At 5.45 P.M. she made herself vomit, and after this she improved rapidly, her breathing became easier, and the intense itching of the hands and feet began to subside, but it was followed by distinct erythema, her legs from the feet to the hips becoming bright scarlet. When the itching of her hands and feet had stopped, she realised that the skin of her abdomen and back was itching too, but not so severely, and no rash developed in these areas. The pelvic and abdominal pain disappeared a few minutes after she had vomited. During the next hour her symptoms subsided and her confidence returned, but a heavy bursting headache developed. The erythema was the last sign to disappear. By 7.15 P.M. she had recovered completely except for the headache. Apart from making herself vomit by irritating her uvula she had had no treatment.

Penicillin History

Four years previously she had been given 500,000 units of crystalline sodium penicillin intramuscularly twice daily for four days for tonsillitis, with no ill effect. Two years previously she had had a similar course repeated for the same condition. There was no reaction. A year previously she had had a third course for a sore throat, again without reaction. She had also had three or four short courses of penicillin lozenges (self-administered) for sore throats during this period, and nothing unusual had happened on any of these occasions. As a theatre sister she had, no doubt, inhaled penicillin powder when wounds were being insufflated in the theatre (a practice now abandoned in this unit), and she had also been exposed for several years to chance contamination with liquid penicillin when it was used in infected wounds. She had noticed sensitivity reactions to certain brands of face powder.

The penicillin.—The bottle of penidural oral suspension was returned to the makers and passed all the routine laboratory tests satisfactorily. Its potency was standard, there was no bacterial contamination, and two members of their staff took a dose without any ill effects.

The gradual development of hypersensitivity to penicillin is illustrated in case 2.

Case 2.—Seven years ago a young female physiotherapist took about eight penicillin lozenges in two to three days for a sore throat. There was no sensitivity reaction. Three years ago penicillin cream was applied to spots on her face. The spots cleared and there was no reaction. One and a half years ago intramuscular injections of penicillin (type and source unknown) were given once daily for three days for a septic finger. There was no reaction. A year ago penidural 300,000 units was taken twice daily for three days for sinusitis. As each dose was swallowed it stung her tongue like pepper; later her tongue became sore, smooth, red, and shiny and felt swollen. After each dose she had a burning sensation in the throat, similar to heartburn, and she was nauseated. Six weeks ago she had another attack of sinusitis and was given a daily intramuscular injection of penicillin, starting with 200,000 units on the first day, and, there being no reaction, she received 400,000 units by intramuscular injection on each of the next five days. On the last day of the injections the area of the vastus lateralis of the right thigh, which had received five of the injections, became swollen, hot, and red, and itched excessively. There was also some itching of the left thigh, where one injection had been given. She was given two anti-histamine pills that evening. Two days after the last injection she felt giddy and had difficulty in focusing. Seven days after the last injection the joints of the ring finger of her left hand became hot, swollen, and painful. Eight days after the last injection her right hand became swollen and painful, and urticarial weals developed on her hands, wrists, and left foot. Over the next few days the urticaria became generalised and more troublesome, but she gained some relief from 'Thephorin' ointment. Complete recovery took about a month from the time of the last injection.

The slight reaction to oral penicillin seems to have been the first indication of a developing sensitivity; the next course of therapy caused more severe reactions, and further treatment with penicillin would be most unwise.

Discussion

Welch et al. (1953) reported a fatal reaction to one tablet of dibenzylethylenediaminedipenicillin ('Bicillin') and mentioned one other anaphylactic reaction to oral penicillin without further comment.

Eisenstadter and Hussar (1954) reported the onset of abdominal cramps, itching, pain in the hands, cold sweat, and urinary incontinence in a young woman, aged 22, ten minutes after taking one tablet of penicillin (300,000 units).

Lang and Clagett (1955) reported the case of a woman, aged 53, who took a tablet of penicillin (200,000 units) for a sore throat. A minute or two later she felt tingling in her lips and became unconscious. She became cyanotic, and her pulse was barely palpable. She was given fifteen minims of adrenaline (route not stated) and recovered consciousness, but her lips and nail-beds were cyanotic even when she was in an oxygen tent. A generalised erythematous blush involved almost all her body except the face. Her lips, tongue, and hands were moderately œdematous. She had no respiratory obstruction, and her breath sounds were normal. It was nine hours before she had recovered completely. She had previously had an allergic skin reaction to a hair-setting lotion, and exposure to dust usually caused respiratory symptoms. She had received intramuscular penicillin on several occasions and also taken penicillin by mouth previously with no ill effects.

Calvert and Smith (1955) reported a moderate constitutional reaction in a fit man five minutes after sucking a penicillin lozenge containing only 1000 units of penicillin. This appears to have been his first acquaintance with the drug. Two weeks later he reacted very violently to an intramuscular injection of 1,000,000 units of penicillin given for crural cellulitis and was unconscious for fifteen minutes.

Madalin (1954) reported a similar but more profound response to a penicillin lozenge. His patient had previously had penicillin and was later shown to be extremely sensitive.

According to Kern and Wimberly (1953) 1 patient in 7 is an allergic subject and therefore liable to become sensitised sooner or later to penicillin. They pointed out that during the first nine years of penicillin therapy only 2 deaths due to penicillin were published, but in the next eighteen months 15 more were reported, and the death-rate appears to be increasing steadily, accompanied by a parallel increase in the number of severe reactions. These workers state that a reaction taking more than fifteen minutes to develop after the administration of penicillin is rarely fatal.

Penicillin administered by any route can give rise to sensitivity, topical applications in the form of creams being especially culpable. The use of penicillin in any form should be restricted to occasions when there is a real clinical indication for it, and it should not be used for trivial conditions which can be expected to heal without its use. The inclusion of penicillin in tooth-paste, chewing-gum, and similar substances seems to be entirely indefensible.

An increase each year in the number of reactions to penicillin can be expected as more of the population have had previous courses of such treatment. If a patient

requiring antibiotic treatment gives a history of sensitivity to previous penicillin therapy some other antibiotic should be used. Desensitisation is possible but takes a long time (O'Driscoll 1955).

A negative history of previous penicillin therapy may be misleading. Injections are usually remembered, but the use of creams, medicated tulle gras, eye drops, ear drops, lozenges, insufflations, intrapleural and intrathecal instillations, and irrigation of wounds with liquid penicillin may be forgotten, or the patient may not have appreciated that penicillin was being used. Even if no reactions have followed previous penicillin therapy, there is no guarantee that the next course will be equally uneventful, as illustrated in the 2 cases reported here.

Anaphylactic reactions have followed the administration of penicillin by most, if not all, routes. Cunningham (1955) says that depot penicillins are more potent sensitisers than crystalline penicillin.

On this unit we are now meeting about one patient a month who is sensitive to penicillin, and it seems advisable that such individuals should carry a disc or card recording their hypersensitivity to penicillin.

Summary

An anaphylactic reaction to oral benzathine penicillin ('Penidural') is described.

1 patient in about 7 will eventually become sensitive to penicillin after repeated penicillin treatments. Therefore the unnecessary use of this valuable drug in any form is deplorable.

I wish to thank Dr. W. A. Carruthers and Dr. A. Ruffman for the previous histories of case 1 and case 2 respectively; Prof. A. G. R. Lowdon for help and criticism in the preparation of this paper; my colleagues Mr. F. Braithwaite and Mr. F. I. Herbert for their interest and encouragement; Dr. G. R. Fryers for arranging the laboratory examinations of the sample of penidural; and Messrs. John Wyeth Brother, Ltd., for their helpful coöperation.

REFERENCES

Batchelor, R. C. L., Horne, G. O., Rogerson, H. L. (1951) *Lancet*, ii, 195.

Bell, R. C. (1954) *Ibid*, i, 13.

— Rannie, I., Wynne, N. A. (1954) *Ibid*, ii, 62.

Calvert, R. J., Smith, E. (1955) *Brit. med. J.* ii, 302.

Cunningham, J. A. K. (1955) *N.Z. med. J.* **54**, 261.

Eisenstadter, D., Hussar, A. E. (1954) *Amer. Practit.* **5**, 783, cited by Lang and Clagett (1955).

Kern, R. A., Wimberley, N. A. (1953) *Amer. J. med. Sci.* **226**, 357.

Lang, L. P., Clagett, H. jun. (1955) *New Engl. J. Med.* **253**, 652.

Madalin, H. E. (1954) *J. Mich. med. Soc.* **53**, 51, cited by Calvert and Smith (1955).

O'Driscoll, B. J. (1955) *Brit. med. J.* ii, 473.

Welch, H., Lewis, C. N., Kerlan, I., Putnam, L. E. (1953) *Antibiot. Chemother.* **3**, 891, cited by Lang and Clagett (1955).

THE SAFE PERIOD

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IN spite of its perennial appeal as a natural method of family limitation, the safe period (synonyms: the infertile period, the rhythm) does not receive the general recognition it deserves. Lewis-Faning (1949) reported that only a "trivial" number of people used the safe period, and Guttmacher et al. (1949) found that only 3% of their private patients used it.

The concept of a safe period rests on the assumptions that ovulation takes place 14 days before the onset of the next menstrual period (Ogino 1932, Knaus 1932, 1934), and that the life of the spermatozoa is limited to 48 hours and that of the ovum to 24 hours after extrusion. However, because of unpredictable variations in these events, it is found empirically that a good margin of days must be allowed on either side of the theoretical date of ovulation. The longer the period of abstinence in the middle of the cycle the less chance there is of conception. We usually advise 14 days' abstinence—i.e., 7 days before and 7 days after the calculated date of ovulation. Therefore for a 28-day cycle there should be abstinence from the 7th to the 21st day and for a 35-day cycle from the 14th to the 28th day. This is a longer interval than most workers advocate, which accounts for our lower failure-rates.

Methods and Materials

In the small community which we serve, about two-thirds of the patients use the rhythm. The records of 1000 private obstetrical and gynæcological patients were examined for information about the use of the safe period, and only those cases in which the present reproductive status was known were analysed. These therefore represented virtually a random selection. No follow-up was feasible on the untraced patients, but these would not have the negative importance which they would have if they had been attending a rhythm clinic. The reduced group finally numbered 156 patients after the following classes had been excluded to make the test more rigorous:

Time-group	No. of patients	Months' exposure	No. of pregnancies	Patient failure	Method failure	Abandoned
6–12 mos. ..	42	392	14	3	5	6
1–2 yr. ..	66	1198	16	5	3	8
2–3 yr. ..	25	744	4	1	0	3
3–4 yr. ..	4	173	3	1	0	2
4–5 yr. ..	3	150	2	0	1	1
More than 5 yr.	16	2030	6	0	4	2
Totals ..	156	4687	45	10	13	32

4687 woman-months = 390·6 woman-years.
Total failures (23) = 5·9 pregnancies per 100 years' exposure.
Method failures (13) = 3·3 " " " " "

(1) Those who had never been pregnant, to exclude cases of primary sterility.

(2) Those who had used the system for less than 6 months, to eliminate the purely fortuitous failure to conceive in otherwise normally fertile people.

(3) Those over the age of 42, to exclude menopausal depression of fertility.

This type of investigation cannot take into account such factors as infrequent intercourse, intercurrent illness, unsuspected secondary sterility, and inaccurate information, all of which would tend to give unduly favourable results.

Results

The accompanying table gives the results of this survey considered under the various durations of use of the safe period. "Months' exposure" is calculated by adding together the months of use of each patient in each particular time-group. The number of pregnancies in each group is listed, and in the next columns they are described as either "Patient failure" where the patient failed to keep to the prescribed days for whatever reason, or "Method failure" where the patient followed the instructions accurately but pregnancy took place. The last column lists for the sake of completeness those who conceived after abandoning the method.

Discussion

The results in this small series are found to be better than those previously published:

Tietz et al. (1951), in a 15-year study from a safe-period clinic, describe 409 patients who in 605·6 woman-years had 87 accidental pregnancies, which gives a failure-rate of 14·4

pregnancies per 100 years' exposure. This, they state, is significantly higher than the results claimed by the most successful users of contraceptives—i.e., 6–7 pregnancies per 100 years' exposure. They advise only 10 days' abstinence—i.e., from the 9th to the 19th day of a 28-day cycle—which we hold to be quite inadequate for safety. A significant number of patients will conceive on the 7th, 8th, 20th, and 21st days of such cycles. This is confirmed by Pommerenke (1953), who gives a graph of the distribution of the days of conception in 159 cases.

Fleck et al. (1940) reported on 207 cases in which the safe period was used. The number of unplanned pregnancies was 21, corrected to 6, which gave a failure-rate of 3%.

Latz and Reiner (1942) analysed 11,249 menstrual cycles in safe-period users, covering 49,356 acts of intercourse not followed by pregnancy.

On the other hand, there is in the use of contraceptives a higher failure-rate than is generally realised :

Lewis-Faning (1949) found that 23% of all pregnancies in contraceptive users were due to failure.

Finkelstein et al. (1952), writing on the effectiveness of jelly as a contraceptive, report 16·7 patient failures and 10·8 method failures per 100 woman-years, and cite 10 studies on contraception with an average failure-rate of 22·3.

Tietz et al. (1953), investigating the effectiveness of the cervical cap, had 13·7 failures per 100 woman-years.

Guttmacher et al. (1949) reporting 2000 private obstetrical patients, whom one would expect to have the strongest motivation and most intelligent coöperation, state that 18·7% of the pregnancies were the result of failure of contraception.

Eastman and Seibels (1949) studied 333 women using only suppositories and found 16·2 total failures and 11·1 method failures per 100 woman-years. They are opposed to diaphragm methods and cite failure-rates of 12–33 per 100 woman-years for these devices.

To the common query " How safe is the safe period ? " no brief answer can be given, because there is a sliding scale of safety depending on the days used. The present series gives satisfactory results ; but, if intercourse is restricted to 6, 5, 4, or fewer days before the next period, increasingly greater security is obtained.

In the presence of irregular cycles the earliest and latest dates of ovulation are calculated and 7 days before and 7 days after these dates are included in the fertile period. When the cycles are hopelessly irregular, it is sometimes impossible to calculate a safe period, but occasionally a guide to ovulation is found in the occurrence of *Mittelschmerz*, or the discharge of ovulatory mucus, or the woman's morning-temperature record, which may show the typical biphasic variation recognisable in retrospect. Alternatively, hormone treatment with an œstrogen-progesterone sequence may produce some regularity of the cycles.

Summary

The nature of the safe period is discussed and results in 156 patients are reviewed.

The total failure-rate of 5·9 and the method failure-rate of 3·3 pregnancies per 100 woman-years is compared with the higher failure-rates reported with various contraceptives.

REFERENCES

Eastman, N. J., Seibels, R. E. (1949) *J. Amer. med. Ass.* **139**, 16.

Finkelstein, R., Guttmacher, A., Goldberg, R. (1952) *Amer. J. Obstet. Gynec.* **63**, 664.

Fleck, S., Snedeker, E. F., Rock, J. (1940) *New Engl. med. J.* **223**, 1005.

Guttmacher, A. F., Tietz, C., Rubin, S. (1949) *J. Amer. med. Ass.* **140**, 1265.

Knaus, H. (1932) *Zbl. Gynäk.* **56**, 710.

— (1934) Die periodische Fruchtbarkeit und Unfruchtbarkeit des Weibes. Vienna

Latz, L. J., Reiner, E. (1942) *Amer. J. Obstet. Gynec.* **43**, 74.

Lewis-Faning E. (1949) Family Limitation and Its Influence on Human Fertility During the Past Fifty Years. H.M. Stationery Office ; vol. i.

Ogino, K. (1932) *Zbl. Gynäk.* **56**, 721.

Pommerenke, W. T. (1953) *J. Obstet. Gynæc. Brit. Emp.* **60**, 519.

Tietz, C., Lehfeldt, H., Liebmann, H. G. (1953) *Amer. J. Obstet. Gynec.* **66**, 904.

— Poliakoff, S. R., Rock, J. (1951) *Fertil. and Steril.* **2**, no. 5.

BONE-MARROW DEPRESSION IN TETANUS

REPORT OF A FATAL CASE

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IN the case described here, severe tetanus was treated by curarisation and continuous artificial respiration under nitrous-oxide anæsthesia. The course of events is of particular interest in the light of similar cases reported by Lassen et al. (1956), who concluded that long-continued administration of nitrous oxide may cause bone-marrow aplasia. We were unaware of their findings.

Case-report

On April 4, 1956, a 54-year-old wharf labourer was admitted to the Royal Melbourne Hospital suffering from moderately severe tetanus with trismus, dysphagia, some generalised muscle rigidity, and intermittent tetanic spasms. Twelve days previously his finger had been crushed on the wharf, and the injury had been treated by suture, no antitetanic serum being given. The finger was now gangrenous.

Treatment on admission was in keeping with the method of Lassen et al. (1954) ; early tracheotomy was performed, and the finger was amputated. Relaxation was attempted with mephenesin (' Myanesin ') via Ryle's tube, coupled with sedation. Twenty-four hours after admission the patient's condition had deteriorated, with severe respiratory impairment and we decided to change to intermittent positive-pressure artificial respiration through a cuffed tracheotomy tube, using nitrous-oxide/oxygen anæsthesia and *d*-tubocurarine (' Tubarine ') for muscular relaxation.

Course of Illness

On admission blood examination revealed hæmoglobin 15·3 g. per 100 ml. and leucocytes 15,000 per c.mm., the absolute neutrophil-count being 12,000 (see figure). The leucocyte-count decreased slightly on the third day ; but by the fifth day it was only 1000 per c.mm., with 640 neutrophils, and platelets numbered 47,000 per c.mm. A smear showed a marked shift to the left in the neutrophil series.

Because of this severe, almost certainly toxic, depression in circulating granulocytes and thrombocytes, it was thought necessary to modify treatment. The *d*-tubocurarine, of which 700 mg. had now been given, was regarded as the most likely toxic agent, particularly in view of the experiences of Lassen et al. (1954) and of Last and Nicholas (1956) in this hospital. But, as the patient's condition required the continuance of curarisation, the only modification was the substitution of gallamine triethiodide for the *d*-tubocurarine.

On the seventh day a bone-marrow biopsy from the iliac crest revealed hyperplasia and distortion of the myelocyte series associated with a gross reduction of band forms and mature polymorphs. The red-cell series showed a relative reduction, and megakaryocytes appeared normal. The pathologist's conclusion was agranulocytosis, possibly of toxic origin. At this time generalised purpuric spots and a tendency to bleed from the tracheotomy were also noted.

On the tenth day the patient suddenly collapsed with severe hypotension. This was believed primarily to be due to toxæmia from a severe pulmonary infection which had developed in spite of antibiotics. A probable additional factor was thought to be blood-loss into the bowel and serous cavities due to the tendency to bleed. There was now an associated fall in hæmoglobin, which had previously remained steady in spite of continued neutropenia. (The previous day's count was 1260 neutrophils per c.mm., and almost all were grossly

abnormal in appearance, the nuclei showing distortion to flattened ribbon-like forms with added vacuolation of the cytoplasm.) After resuscitation with blood-transfusion and hypertensive agents the patient's general condition improved. However, because of the bone-marrow depression and severe toxæmia, treatment with large doses of cortisone and erythromycin was begun.

On the twelfth day the hæmoglobin was 15·2 g. per 100 ml. the leucocyte-count had risen to 6000 per c.mm. (atypical neutrophils 5200), the platelet-count had fallen to 9000 per c.mm., and the blood-urea level was 160 mg. per 100 ml., associated with pronounced oliguria for the past two days.

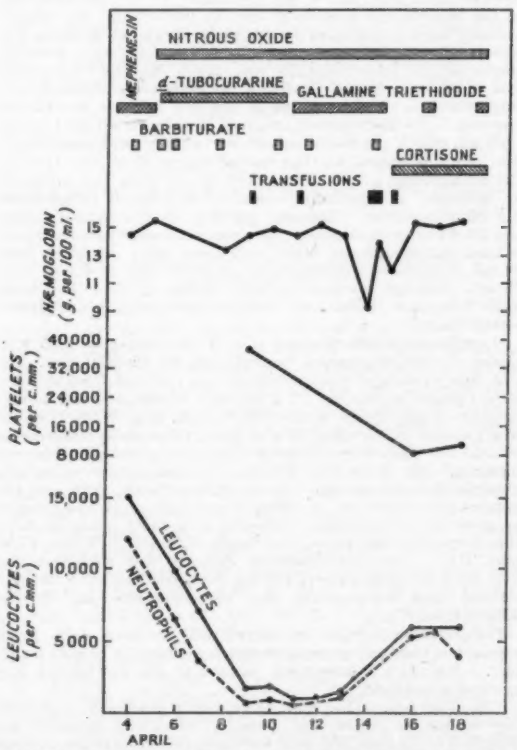
Over the succeeding three days the patient's condition was much the same; spasms still occurred but were controlled with nitrous oxide alone, and attempts to allow him to breathe voluntarily were unsuccessful. The urinary output improved slightly, but dependent œdema appeared. On the fourteenth day the leucocytes were still 6000 per c.mm. with a similar differential count; platelets were still very scanty; and the blood-urea level rose further to 220 mg. per 100 ml. He then rapidly deteriorated, and he died early on the fifteenth day after admission to hospital. A bone-marrow biopsy just before his death showed a generalised maturation arrest of all the cellular elements of the marrow.

Necropsy Findings

Dr. K. Bowden found old healed tuberculous lesions at the apices of both lungs, which were œdematous and showed recent generalised bronchopneumonia. The kidneys microscopically showed recent patchy tubular necrosis, and there was generalised œdema of all tissues.

Discussion

Depression of the neutrophils apparently began soon after the commencement of artificial respiration (see figure). At this time the drugs which had been used were nitrous oxide, oxygen, *d*-tubocurarine, a small amount of mephenesin and barbiturate, antitetanic serum, penicillin, and streptomycin. The rise in the number of neutrophils following the administration of cortisone is interesting, though we cannot be sure that the cortisone was responsible for it.



Relation between the fall in white cells and platelets and drugs used.

In a previous severe case of tetanus, successfully treated in this unit recently and reported elsewhere by Last and Nicholas (1956), granulocytopenia also developed. At that time suspicion was cast both on *d*-tubocurarine and the anti-histamine drug antazoline ('Antistine'). However, on reviewing the findings, it is apparent that nitrous oxide can also be incriminated, and that there was a pronounced rise in leucocytes after its administration ceased.

From our experience of these two cases showing bone-marrow depression, we support the suggestion of Lassen et al. (1956) that nitrous oxide, or a commercial impurity in it, is the toxic agent responsible. There is still a possibility, however, that this depression may be caused by the tetanus toxin or by *d*-tubocurarine.

The damage to the kidneys in the present case was probably the result of hypotension and ischæmia but could also be of toxic origin.

For these reasons we favour treating further cases of tetanus by methods which do not involve the continuous use of nitrous oxide until the situation is further clarified.

Summary

A case of severe tetanus treated by curarisation and continuous artificial respiration under nitrous-oxide/oxygen anæsthesia is described.

The fatal outcome was largely caused by bone-marrow depression, apparently induced by the treatment.

The work of Lassen and his colleagues (1956), together with our own limited experience, suggests that nitrous oxide was responsible.

We wish to acknowledge the help of many members of the resident medical staff of the Royal Melbourne Hospital in treating this case, and to thank Dr. I. J. Wood, head of the clinical research unit, for permission to publish.

REFERENCES

Lassen, H. C. A., Bjørneboe, M., Ibsen, B., Neukirch, F. (1954) *Lancet*, ii, 1040.
— Henriksen, E., Neukirch, F., Kristensen, H. S. (1956) *Ibid.* i, 527.
Last, P. M., Nicholas, J. (1956) *Med. J. Aust.* (in the press).

RENAL INFARCTION WITH HYPERTENSION

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THE case reported here was first diagnosed as one of renal colic. When hypertension with encephalopathy appeared the diagnosis was changed to renal infarction. Nephrectomy led to the patient's recovery.

Case-report

A man, aged 36, was first seen on Aug. 14, 1953, with two days' history of recurrent attacks of severe colicky pain in the left flank. They came on at various intervals and lasted from several minutes to hours. The colic started in the left costovertebral angle and radiated round the loin into the left iliac fossa and pubic region. There had been no previous attacks of similar pain. The patient had been in excellent health.

Physical examination was entirely negative, except for much tenderness over the left kidney anteriorly and in the left costovertebral angle. The urine contained many red blood-cells but no pus cells or casts.

Radiography.—Plain films revealed several phleboliths in the pelvis, an opacity which measured 2 × 1 mm. to the left of the most distal sacral segment and several opacities above the right iliac crest. Gas in the colon obscured

the renal shadow. Further plain films taken next day again showed the opacity to the left of the sacrum. The outline of the left renal shadow was again obscure, but there were no other opacities. On intravenous pyelography both kidneys excreted the dye promptly and appeared normal, except for fragmentary filling of the left ureter. The small opacity to the left of the sacrum was thought to be due to a small ureteral stone, and left ureteral colic was diagnosed.

Treatment was expectant. The patient remained fairly comfortable, with the aid of sedatives, for eleven days, and then reported that his pain was worse. On examination no change was found, except that the tenderness was less acute. The patient's blood-pressure was 170/96 mm. Hg. His urine contained 2 or 3 leucocytes and 2 or 3 red cells per high-power field but no casts. Its specific gravity was 1·020.

Cystoscopy on Aug. 28, 1953, showed a normal bladder. Indigo-carmine came from the right ureter in good concentration in three minutes but none from the left kidney in twenty minutes. The right ureter was catheterised with ease, but the catheter could only be passed 1·5 cm. up the left ureter, and still no dye appeared from the left ureter.

Progress.—Next day the patient complained of feeling "out of sorts" and of a suboccipital and frontal headache. He said he had been having these headaches for several days past. His temperature rose this day to 102·2°F and stayed about there for five days and then dropped to 99–100°F for a week. He was given oxytetracycline. Culture of the urine produced *Micrococcus ureæ*. Four days after cystoscopy he developed left epididymitis, which settled down in a few days.

Radiography.—On Sept. 11, 1953, plain films revealed opacities resembling calcified mesenteric glands on the right side. Intravenous pyelography showed that the right kidney was working, but there was no evidence that the left kidney was.

Further Progress.—The patient gradually improved; his temperature returned to normal, the renal pain subsided, the epididymitis resolved, and he was discharged from hospital on Sept. 16, 1953. He was seen again on Sept. 26, 1953, when he felt well except for headaches, which were relieved by gr. 10 of aspirin. Seen again on Oct. 10, 1953, he reported that, after riding in a truck, he began to have gross hæmaturia but no pain. His urine contained many red blood-cells. The non-protein nitrogen content of his blood was estimated as 28 mg. per 100 ml. In the next five weeks the patient telephoned several times, saying he was well but still having headache.

Intravenous pyelography on Nov. 11, 1953, showed that the right kidney was working properly, but that the left kidney was probably enlarged. No essential change was found compared with Sept. 11, 1953.

Seizure:—At 4.30 A.M. on Nov. 15, 1953, after being asleep for about four hours, the patient was found lying on the floor frothing at the mouth, and semiconscious. His wife reported that, apart from his headaches, he had been feeling well. For two days he had had an abnormal craving for salt and had been drinking great quantities of water.

On admission he was semicomatose, lapsing into coma at times, flushed, with faint cyanosis, stertorous breathing, no obvious paresis or paralysis, pupils dilated and reacting sluggishly to light, nothing abnormal found in cranial nerves, bilateral extensor plantar response, pulse-rate 120, pulse regular, no heart murmurs, and blood-pressure 210/150 mm. Hg. During the first two or three hours in hospital he continued to have convulsive seizures.

Investigations.—Lumbar puncture produced cerebrospinal fluid clear and under considerable pressure but otherwise normal. Ophthalmoscopy showed that both discs were hazy, the right disc being swollen, with œdema of retina, spastic veins slightly compressed by arteries, but no exudate or hæmorrhage. After two more seizures the fundi were re-examined (Dr. H. Grieve) and showed definite swelling and œdema of the discs and retinæ and two fine striate hæmorrhages in the left disc. Hypertensive encephalopathy was diagnosed, and the patient was given paraldehyde sodium, phenobarbitone, and morphine, but they did not control his convulsions. His urine contained albumin 100 mg. in 100 ml., no sugar, an occasional pus cell, and a few red cells; its specific gravity was 1·020. Examination of the blood showed Hb 112% (16·2 g. per 100 ml.), non-protein nitrogen 42 mg. per 100 ml., glucose 116 mg. per 100 ml., white cells 25,500 per c.mm. (differential count normal).

Progress.—During the day he remained unconscious but with periods of semiconsciousness, would mumble incoherently, and vomited occasionally. His face and arms would twitch, and he continued to have convulsive seizures with cyanosis lasting a half to two minutes. His blood-pressure was 210/150–215/130 mm. Hg. Phlebotomy produced only 200 ml. of blood, owing to the patient's restlessness. At 4 P.M. on the day of admission 500 ml. of blood was withdrawn, and 10 ml. of 50% dextrose was given intravenously. After this he appeared to settle down, and his blood-pressure decreased to 150/110–160/120 mm. Hg. During the next three days he remained semiconscious, restless, and incontinent. His blood-pressure rose again to 215/150 mm. Hg. Radiography of skull and chest and culture of the urine were negative. Gradually he became more conscious, could talk coherently, but had amnesia and complained of severe frontal headache. Repeated examination of his urine showed a low specific gravity (1·008–1·012) and occasional granular casts. The non-protein nitrogen content of his blood remained about 40 mg. per 100 ml. The specific gravity of his urine gradually decreased to 1·002–1·004, and he began to complain of seeing red and green lights and black spots on the ceiling. By Nov. 21, 1953, he was alert, cheerful, and eating his meals well, but headache was severe at times. His blood-pressure was about 160/100 mm. Hg. On Nov. 28, 1953, he had a slight convulsion without loss of consciousness. His blood-pressure was 180/120 mm. Hg.

Cystoscopy (Dr. A. B. Sinclair) on Nov. 29, 1953, showed bladder normal; clear active efflux at right ureteric orifice; left ureteric orifice active, but no efflux. Indigo-carmine showed in good concentration in three minutes from the right orifice but none from the left orifice in fifteen minutes. Catheterisation of the left ureter was easy, but no urine or dye was obtained. Water injected and withdrawn showed no colour change. It was concluded that the left kidney was not working.

Nephrectomy—At 10 A.M. on Dec. 4, 1953, the left kidney, when removed, was found to be about two-thirds of the size of a normal kidney. It was bluish, with irregular yellow areas on the cortex. Its capsule stripped unduly easily. The left adrenal gland was normal. The left renal artery was shrunken and did not bleed.

The blood-pressure before anæsthesia was induced was 190/140 mm. Hg, but it fell gradually to 150/90 mm. Hg at the end of the operation and to 90/76 mm. Hg fifteen minutes later and began to fluctuate down to 60 mm. Hg systolic (diastolic unobtainable). When 20 mg. methylamphetamine hydrochloride was given the blood-pressure rose to 96/72 mm. Hg. Early in the afternoon more methylamphetamine was given but it did not control the blood-pressure. An intravenous infusion of noradrenaline (4 ml. in 1000 ml. of 5% glucose in water) was started and maintained the blood-pressure at the satisfactory level of 110/74–120/80 mm. Hg. At 8.30 P.M. 350 ml. of urine was obtained by catheter. It gradually became more difficult to maintain the blood-pressure. The rate of flow of the noradrenaline was 28–64 drops a minute. The patient's condition remained critical during all the night and next day; at noon only 90 ml. of urine was obtained by catheter, and at 4 P.M. only 28 ml., although his postoperative intake of fluids had been 6160 ml., and there had been no vomiting or apparent hæmorrhage.

A right paravertebral block (Dr. J. Andrews) at 8.25 P.M. raised the blood-pressure immediately to 220/130 mm. Hg. The rate of flow of noradrenaline was reduced from minims 60 a minute to minims 12 a minute, whereupon the blood-pressure promptly dropped to 98/64 mm. Hg. When the rate was increased to minims 40 a minute, the blood-pressure rose to 200/100 mm. Hg, all these changes taking place in ten minutes. At 10.25 P.M. 400 ml. of clear amber urine was obtained by catheter and 120 ml. an hour later. At 3 A.M. the patient passed 400 ml. of urine. From then on it was possible to give the noradrenaline infusion at a more constant rate, the blood-pressure remaining more constant (120/60–140/80 mm. Hg). The noradrenaline infusion was continued for five days postoperatively, having been reduced to 8 drops a minute and maintaining the blood-pressure at 110/64–120/80 mm. Hg.

Complication.—Phlebitis developed in the left great saphenous vein owing to the continuous infusion of noradrenaline. Although it was very painful it did not slough and gradually resolved.

Convalescence.—The patient's condition gradually improved; his output of urine was normal, his blood-pressure was 128/88–112/78 mm. Hg, and the non-protein nitrogen content of the blood was 35 mg. per 100 ml. On Dec. 22, 1953, the

blood-pressure was 115/80 mm. Hg, the optic fundi were normal, and the patient felt well. He was discharged on Dec. 23, 1953 (nineteen days after the operation).

Operation Specimen.—The left kidney measured 8·0 × 4·5 × 2·0 cm. Its thin capsule stripped fairly readily from a pale and finely granular surface. At about the mid-point of the lateral aspect was a wedge-shaped infarct 7 × 2 cm. depressed 4 mm. beneath the surrounding surface. On section the cortex measured 6 mm. thick except in the depressed area, where it measured 2 mm. or less. No thrombus was found in any renal vessel. The pelvis was slightly thickened but smooth. The ureter was normal. Histologically the depressed area was very different from the rest of the kidney. Only remnants of convoluted tubules were seen, surrounded by fibrous tissue which also surrounded fibrosed glomeruli. At the periphery of the area was a zone occupied by large numbers of lymphocytes. The arteries in this zone only were thickened and hypertrophied. The medulla was relatively intact. No definite lesion was found elsewhere in the kidney.

Follow-up.—On Jan. 10, 1954, the patient was fit in every way, with blood-pressure 118/80 mm. Hg and optic fundi normal. He wanted to resume work. On March 20, 1954, he was well in every way and back at work, with fundi normal and blood-pressure 120/80 mm. Hg. On Nov. 2, 1955, he was working full time, with fundi normal, and blood-pressure 118/80 mm. Hg. His urine had been consistently normal, sp. gr. 1·020, no albumin, casts, or red cells. The non-protein nitrogen content of the blood was 28 mg. per 100 ml.

Summary

A case of renal infarction with hypertensive encephalopathy is described.

After nephrectomy the patient's condition was critical for several days.

Suppression of urine appeared to be impending. Paravertebral block on the contralateral side apparently relieved this.

The patient's health and physical condition two years later are normal.

ACQUIRED HÆMOCHROMATOSIS FOLLOWING MULTIPLE BLOOD-TRANSFUSIONS FOR HYPOPLASTIC ANÆMIA

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THE adjectives "acquired," "secondary," and "exogenous" are applied to hæmochromatosis when it is not due to an inborn error of metabolism. Such cases, unlike the classical disease, are always associated with a chronic anæmia (Sheldon 1935), and most of the patients have received multiple blood-transfusions. 8 such cases were associated with cirrhosis of the liver and diabetes mellitus (Aufderheide et al. 1953, Block et al. 1952, Bomford and Rhoads 1941, Morningstar 1955, Schwartz and Blumenthal 1948), and with an abnormal glucose-tolerance curve (Zeltmacher and Bevans 1945). 13 were associated with hepatic cirrhosis without diabetes (Bomford and Rhoads 1941, Bothwell et al. 1953, Chesner 1946, Cottier 1952, Davies 1955, Kark 1937, Mackey 1942, Schwartz and Blumenthal 1948, Wyatt et al. 1950) and 9 with hæmosiderosis and fibrosis of the liver (Bothwell 1953, Lennox 1952, Morningstar 1955, Schwartz and Blumenthal 1948, Wyatt and Goldenberg 1949, Wyatt et al. 1950). Hæmochromatosis developed in 5 patients when no blood, or only an insignificant amount, had been transfused; in 4 cases large amounts of iron had been given orally (Block et al. 1952, Castleman and Towne 1952, Goldish and Aufderheide 1953, Houston 1951, Wallerstein and Robbins 1953); only 2 patients had diabetes.

In the case reported here hæmochromatosis developed with skin pigmentation and diabetes mellitus after nine years' regular blood-transfusions for hypoplastic anæmia.

Case-report

A naval airman, aged 20, had used a cellulose paint containing benzol, acetone, and other volatile solvents in a closed shed and without a respirator on four occasions between January and May, 1946. In June he reported sick with a week's history of general malaise and dyspnœa on exertion. Clinical examination revealed pallor but nothing else of significance, and his hæmoglobin was 20%. He was therefore admitted to the Royal Cornwall Infirmary under the care of Dr. C. T. Andrews for full investigation.

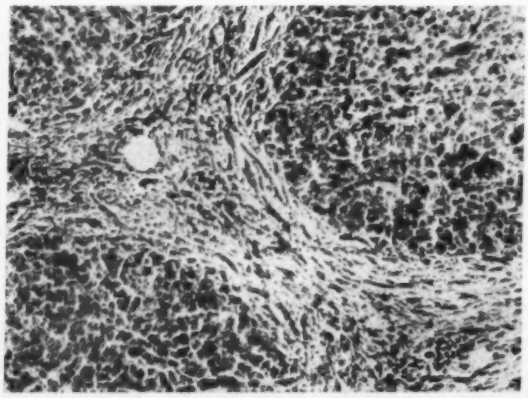
On admission physical examination was again negative apart from the pallor; there was no relevant past or family history and no family history of diabetes. Examination of the blood showed Hb 20%; red cells 1,420,000 per c.mm.; colour-index 0·71; white cells 3500 per c.mm. (polymorphs 30%; lymphocytes 64%, monocytes 1%, eosinophils 2%, basophils 3%), reticulocytes less than 1%. The red cells were well filled with hæmoglobin and showed only some anisocytosis, and the platelets appeared normal; no abnormal white blood-cells were seen. Sternal puncture revealed a cellular marrow with complete absence of red-cell precursors, but the myeloid series and megakaryocytes were normal. A pure red-cell aplastic anæmia due to inhalation of benzol or one of the other paint solvents was diagnosed.

Treatment.—All hæmatinic therapy failed; so repeated blood-transfusions were given until the Hb level was 74%. The patient was then transferred to the Royal Naval Hospital at Plymouth, where he was treated until 1949. Regular blood-transfusions were given at a rate of three or four bottles every few weeks and he was allowed home on leave in the intervals. In June, 1949, he was admitted to the London Hospital for a few weeks under Sir Alun Rowlands. His sternal marrow at this time showed scanty normoblasts, but the clinical picture was otherwise unaltered, and regular blood-transfusions were still required. In December, 1949, he was discharged from the Service, and it is estimated that he had received about 180 bottles of blood by that time. His treatment was continued at the Royal Cornwall Infirmary. Until March, 1954, blood-transfusions were given every few weeks; an average of a bottle a fortnight was required, his Hb usually being 50–70%. A typical pre-transfusion blood picture was as follows: Hb 50%; red cells 2,560,000 per c.mm.; colour-index 1·0; white cells 3600 per c.mm. (polymorphs 54%, lymphocytes 32%, monocytes 9%, eosinophils 4%, basophils 1%); reticulocytes less than 1%. The red cells appeared normal in a film. Normal platelets. No abnormal white cells. The sternal marrow was examined about once a year, and the red-cell precursors gradually increased till 1953, when 28% of normoblasts was found, but early in 1954 they were again virtually absent.

Progress.—The patient's general health remained fairly good, and he had no specific complaints, but generalised slaty pigmentation of the skin had gradually developed, and his liver was gradually enlarging. Excess urobilinogen and urobilin were found in the urine, especially after a blood-transfusion, when the patient had noticed his urine was darker than usual. Liver-function tests showed direct van den Bergh negative; bilirubin 1·1 mg. per 100 ml. of serum; thymol turbidity 8 units (normal 1–4); Kunkel turbidity 3 units (normal 0); gold precipitation 5 units (normal 0–1); alkaline phosphatase 11 King-Armstrong units (normal 5–10); and total proteins 6·8 g. per 100 ml. The blood-urea level was 33 mg. per 100 ml. and the erythrocyte-sedimentation rate was 3 mm. in the first hour (Westergren).

Splenectomy.—Early in 1954 it was decided, in consultation with Mr. T. E. Rutter, to remove the patient's spleen because it was considered that a hæmolytic process was partly responsible for the anæmia. Mr. Rutter removed the spleen on March 18. It was about one and a half times the normal size, and the liver was somewhat enlarged and granular; a biopsy specimen of the liver was taken. The patient's immediate postoperative course was uneventful.

Histology.—The spleen showed reticulo-endothelial hyperplasia, with a large amount of hæmosiderin in the reticulo-endothelial cells. The liver (see figure) showed portal cirrhosis and a great quantity of hæmosiderin, mainly in the fibrous tissue between the lobules but also in Kupffer's cells and, to a lesser extent, in the parenchymal cells. No hæmofuscin could be demonstrated in either liver or spleen.



Section of liver showing portal cirrhosis and a great quantity of hæmosiderin, mainly in fibrous tissue between lobules but also in Kupffer's cells, and, to a lesser extent, in parenchymal cells.

Postoperative Course.—No further transfusions were required for three months, the Hb remaining about 80%, but thereafter blood-transfusions had to be resumed. A trial of cobalt-chloride therapy was unsuccessful. An attempt to keep the Hb at a higher level than previously led to fortnightly attendances, when usually two bottles of blood were transfused, and the Hb was kept between 70% and 90%. In November, 1954, the patient complained of lassitude, thirst, polyuria, and loss of weight. The urine, which in March had been normal, had a specific gravity of 1·040 and contained a large amount of sugar and some ketones. The blood-sugar level was 344 mg. per 100 ml., and diabetes mellitus was diagnosed. Control was achieved with a simple carbohydrate-restricted diet and a single dose of 20 units of soluble and 10 units of protamine zinc insulin each morning. The patient remains in fair health, can look after a small-holding with 80 hens and a few pigs, and takes long walks without distress. His diabetes remains stable. There has been an appreciable increase in his pigmentation in the past few years, and there are now some patches of oral pigment. The liver has enlarged since the splenectomy and is now palpable below the level of the umbilicus, and its surface is distinctly irregular. There are no further abnormal physical signs. The sternal marrow at the end of 1954 appeared essentially normal and contained 15% of normoblasts.

Recent Investigations.—Radiography of the chest was negative. A barium swallow and meal showed no abnormality. No occult blood was found in the fæces. Electrocardiography with standard leads, unipolar limb leads, and unipolar chest leads 1, 3, and 5 showed no abnormality. Liver-function tests gave the same results as before, except that the serum-alkaline-phosphatase level had risen to 16 King-Armstrong units and the serum-bilirubin level to 2 mg. per 100 ml. Total serum-protein were 6·8 g. per 100 ml. (albumin 4·8 g. per 100 ml., globulin 2·0 g. per 100 ml.). The survival of red cells was tested with radioactive chromium three weeks after transfusion and showed a half-life of about 16 days. No auto-antibodies were found in the serum. The patient has received about 400 bottles of blood, 360 of them before diabetes developed. He refuses cortisone therapy.

Discussion

The present case shows the three principal features of hæmochromatosis: skin pigmentation, diabetes mellitus, and a cirrhotic liver containing much hæmosiderin. The complete picture developed after nine years' anæmia, after transfusion with about 360 bottles of stored blood, containing some 65 g. of elemental iron (on the assumption that each bottle contains 400 ml. of blood with average Hb concentration 90%).

Introduced parenterally iron must remain in the body because its excretion is negligible; this has been shown by balance studies in man (McCance and Widdowson 1937, 1938, Widdowson and McCance 1937) and by experiments in animals with radioactive iron (Copp and Greenberg 1946, Hahn et al. 1939a). Sheldon (1935) considered that excessive destruction of blood and storage of iron would not give rise to true hæmochromatosis but only to a simple hæmosiderosis without tissue damage, and the results of experiments on animals support this view (Brown et al. 1950, Cappell 1930, Polson 1933). But there are enough published reports of cases of transfusion siderosis with "fibrosis," if not definite cirrhosis of the liver, to suggest strongly that the presence of hæmosiderin can damage cells, at least those of the liver. The accompanying anæmia may also play a part in causing the damage (Womack and Brownlee 1950), and another factor is undoubtedly chronicity (Brown et al. 1950).

The absorption of iron is normally regulated by a "mucosal block" mechanism (Granick 1946, Hahn et al. 1938, 1939b, 1943) which should limit it to the body's needs; but there is evidence that absorption may continue in the presence of a chronic anæmia in spite of already excessive storage of iron (Bothwell et al. 1953, Cottier 1952, Dubach et al. 1948, Wyatt and Goldenberg 1949, Wyatt et al. 1950). This explains the development of acquired hæmochromatosis when little or no blood has been transfused, especially when large amounts of iron have been given orally.

It therefore seems probable that chronic anæmia is the basic abnormality in acquired hæmochromatosis, leading to absorption of iron in excess of requirements and to blood-transfusions from which further iron is released. None of this acquired iron can be excreted and it is stored as hæmosiderin, some in the liver and pancreas, where in time, and perhaps aided by the effects of the anæmia, it causes cellular damage and cirrhosis of these organs.

It is interesting that the diabetes and considerable enlargement of the liver developed in our patient about six months after the splenectomy; possibly removal of this iron-storage depot accelerated the deposition of iron in the liver and pancreas and increased the rate of cell damage.

Summary

A case of acquired hæmochromatosis is described, in which the full clinical picture developed after nine years' regular blood-transfusions for hypoplastic anæmia.

The importance of chronic anæmia in the ætiology is emphasised.

Our thanks are due to Dr. C. T. Andrews, senior physician, West Cornwall Clinical Area, for permission to publish and for valuable criticism; and to Dr. F. D. M. Hocking for the loan of the liver section and Prof. A. C. P. Campbell for the photomicrograph.

REFERENCES

Aufderheide, A. C., Horns, H. L., Goldish, R. J. (1953) *Blood*, **8**, 824.
Block, M., Bethard, W., Jacobson, L. (1952) *J. Lab. clin. Med.* **40**, 781.
Bomford, R. R., Rhoads, C. P. (1941) *Quart. J. Med.* **10**, 175.
Bothwell, T. H. (1953) *S. Afr. J. clin. Sci.* **4**, 53.
— van Doorn-Wittkampf, H. W., Du Preez, M. L., Alper, T. (1953) *J. Lab. clin. Med.* **41**, 836.
Brown, E. B., Moore, C. V., Reynafarje, C., Smith, D. E. (1950) *J. Amer. med. Ass.* **144**, 1084.
Cappell, D. F. (1930) *J. Path. Bact.* **33**, 175.
Castleman, B., Towne, V. W. (1952) *New Engl. J. Med.* **247**, 992.
Chesner, C. (1946) *J. Lab. clin. Med.* **31**, 1029.
Copp, D. H., Greenberg, D. M. (1946) *J. biol. Chem.* **164**, 377.
Cottier, H. (1952) *Schweiz. med. Wschr.* **82**, 873.
Davies, D. M. (1955) *Lancet*, ii, 1064.
Dubach, R., Callender, S. T. E., Moore, C. V. (1948) *Blood*, **3**, 526.
Goldish, R. J., Aufderheide, A. C. (1953) *Ibid*, **8**, 837.
Granick, S. (1946) *J. biol. Chem.* **164**, 737; *Science*, **103**, 107.
Hahn, P. F., Bale, W. F., Hettig, R. A., Kamen, M. D., Whipple, G. H. (1939a) *J. exp. Med.* **70**, 443.
— — Lawrence, E. O., Whipple, G. H. (1938) *J. Amer. med. Ass.* **111**, 2285.
— — — — (1939b) *J. exp. Med.* **69**, 739.
— — Ross, J. F., Balfour, W. M., Whipple, G. H. (1943) *Ibid*, **78**, 169.
Houston, J. C. (1951) *Guy's Hosp. Rep.* **100**, 355.
Kark, R. M. (1937) *Ibid*, **87**, 343.
Lennox, B. (1952) *Postgrad. med. J.* **28**, 313.
Mackey, R. (1942) *Med. J. Aust.* i, 172.
McCance, R. A., Widdowson, E. M. (1937) *Lancet*, ii, 680.
— — (1938) *J. Physiol.* **94**, 148.
Morningstar, W. A. (1955) *Arch. Path.* **59**, 355.
Polson, C. (1933) *Brit. J. exp. Path.* **14**, 73.
Schwartz, S. O., Blumenthal, S. A. (1948) *Blood*, **3**, 617.
Sheldon, J. H. (1935) Hæmochromatosis. London.
Wallerstein, R. O., Robbins, S. L. (1953) *Amer. J. Med.* **14**, 256.
Widdowson, E. M., McCance, R. A. (1937) *Biochem. J.* **31**, 2029.
Womack, C. R., Brownlee, R. C. (1950) *Amer. Practit.* **1**, 731.
Wyatt, J. P., Goldenberg, H. (1949) *Arch. intern. Med.* **83**, 67.
— Mighton, H. K., Moragues, V. (1950) *Amer. J. Path.* **26**, 883.
Zeltmacher, K., Bevans, M. (1945) *Arch. intern. Med.* **75**, 395.

Preliminary Communication

MALIGNANT DISEASE IN CHILDHOOD AND DIAGNOSTIC IRRADIATION IN UTERO

PUBLIC-HEALTH departments all over the country are engaged in an environmental survey which will eventually cover some 1500 children who died of leukæmia or malignant disease before the age of 10 in the years 1953–55. As yet only approximately a third of the case-material has been gathered, but preliminary analysis has yielded a result which should, we feel, be reported without further delay.

The survey covers the whole of England and takes the following form.

The addresses of all children certified as dying from leukæmia or malignant disease during the three years 1953–55 have been collected and the attendant doctors asked for permission to approach the parents. Where the request has been approved, the mother is invited to coöperate by allowing a doctor from the local-authority health department to call and interview her. An interview by the same doctor is also arranged with the mother of a control child of the same age and sex, chosen at random from a list of births in the town or rural district in which the affected child's parents were living when the death occurred.

Of necessity a large number of doctors are conducting these interviews, but they are all following the same conventions and using standard schedules. Provided the parents of the dead child have not moved out of the area, only one doctor interviews each case-control pair. The questionnaires for the children who have died are designed to elicit information about the child's health before the onset of the fatal illness, and the mother's health before and during the relevant pregnancy. All investigations and treatments are recorded, and wherever possible X-ray data are checked with hospital notes. A note is also made of any cases of leukæmia and malignant disease in the family, any degree of consanguinity between parents and grandparents, and certain features of the child's diet and home background. The schedules for the controls ensure that the same facts are obtained up to the age when the corresponding case first showed signs of the fatal illness.

PAST HISTORIES* OF X-RAY EXAMINATIONS AND ANTIBIOTICS IN 547 CHILDREN WITH MALIGNANT DISEASE AND 547 CONTROLS MATCHED FOR AGE, SEX, AND LOCALITY

No. of mothers and children X-rayed		Leukæmia		Other malignant diseases		All malignant diseases	
Period	Type of exposure	269 cases	269 controls	278 cases	278 controls	547 cases	547 controls
Antenatal	Diagnostic—						
	Abdomen	42	24	43	21	85	45
	Other ..	25	23	33	32	58	55
Before conception of survey child	Therapeutic	..	..	..	1	..	1
	Diagnostic—						
	Abdomen	17	24	28	30	45	54
	Other ..	103	88	108	119	211	207
Postnatal (children only)	Therapeutic	1	..	1	..	2	..
	Diagnostic	45	49	46	50	91	99
	Shoe-fittings	55	52	40	46	95	98
†Total no. of mothers ..		140	130	160	154	300	284
Total no. of children ..		89	91	75	84	164	175
Either mother or child X-rayed		179	172	194	198	373	370
Postnatal medication (children)							
Sulphonamides		51	45	42	42	93	87
Antibiotics		68	52	50	58	118	110

* I.e., before the onset of the fatal illness in the affected child or equivalent period in the control child.

† Since a mother or child may appear in more than one X-ray category, the totals in this category are less than the sum of totals in the three preceding ones.

One reason for attempting a nation-wide survey was the possibility that the peak of leukæmia mortality in early life noted by Hewitt [1] might be explained if weak irradiation could initiate malignant changes in a fœtus or very young child. Hence this preliminary analysis of the completed schedules is focused mainly on the X-ray histories. The accompanying table shows the numbers of cases and controls with a history of irradiation of the mother or child. It also gives the numbers of children who received antibiotics or sulphonamides before the onset of the fatal illness or the equivalent date.

It will be seen that although they are alike in other respects, there is one important difference between the children who died and their controls: the number of mothers who had an X ray of their abdomen during the relevant pregnancy was 85 for the cases and only 45 for the controls. In the group labelled Other Malignant Diseases the corresponding figures for growths in different parts of the body were:

	Cases	*Controls*
Brain and appendages	11	9
Kidneys	10	2
Suprarenals	9	4
Lymph-nodes	4	2
All other sites	9	4

So large a total difference between the cases and controls can hardly be fortuitous. Nor, in view of the other resemblances, is it likely to be due to faulty choice of controls or to bias in recording. It could, however, be explained if children who are X-rayed before they are born are more prone to develop leukæmia and other malignant diseases than children who have not been X-rayed in utero.

DISCUSSION

The following facts have been known for some time. First, excessive exposure to radioactive materials may cause not only immediate radiation sickness and death but also the subsequent development of leukæmia and cancer. Secondly, the immediate ill-effects of radiation are disproportionately great when the whole body is exposed. Thirdly, therapeutic irradiation of pregnant women is liable to cause microcephaly and other congenital defects in the fœtus.[2]

In the last twelve months two other disturbing facts about X rays have come to light. In the first place it is now known that radiotherapy can cause leukæmia in adults[3] and cancer in children.[4] Secondly, the dose of irradiation received by the fœtal gonads during diagnostic pelvimetry frequently exceeds 2·5r.[5] The present investigation suggests that, besides causing genetic damage, this apparently harmless examination may occasionally cause leukæmia or cancer in the unborn child.

We acknowledge with gratitude all the help we have received from the health departments of counties and county boroughs, from the mothers of the survey children and from the General Register Office. We also thank the Lady Tata Memorial Trust for contributing generously towards the cost of the survey.

One of us (J. W.) receives a grant from the Medical Research Council.

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1. Hewitt, D. *Brit. J. prev. soc. Med.*, 1955, **9**, 81.
2. Murphy, D. P. Congenital Malformations. Philadelphia, 1947.
3. Court Brown, W. M., Doll, R. Medical Research Council Report. Cmd. 9780. H.M. Stationery Office, 1956; p. 87.
4. Simpson, C. L., Hempelmann, L. H., Fuller, L. M. *Radiology*, 1955, **64**, 840.
5. Osborn, S. B., Smith, E. E. *Lancet*, 1956, **i**, 949.

Reviews of Books

Cancer of the Lung

Pathology, Diagnosis and Treatment. MILTON B. ROSENBLATT, M.D., associate professor of medicine, New York Medical College; JAMES R. LISA, M.D., director, pathology service, New York City Department of Hospitals. New York and London: Oxford University Press. 1956. Pp. 317. £6.

Pulmonary Carcinoma

Pathogenesis, Diagnosis, and Treatment. Editors: EDGAR MAYER, M.D.; HERBERT C. MAIER, M.D. New York: New York University Press. London: Pitman Medical Publishing Co. 1956. Pp. 540. £6.

IT is not surprising that two new monographs on lung cancer should have appeared. The disease is increasing rapidly in the more highly developed and cigarette-smoking countries, where the problems of pulmonary tuberculosis are decreasing and interest is shifting from the one to the other. Both these books are useful additions.

The monograph by Dr. Rosenblatt and Dr. Lisa contains little that is original; but it will be useful for the general medical reader.

The book edited by Dr. Mayer and Dr. Maier, on the other hand, describes original work and thought and is quite the best on lung cancer so far produced. As in most works with many contributors its quality is uneven. But, although some sections might have been more critical and others more elegant, the balance is satisfying, and it provides something of value for readers of all levels of experience and discrimination. One welcome innovation is a chapter on the psychological aspects of lung cancer, written without obstructive psychiatric jargon.

It is a pity that the high price of both monographs puts them beyond the reach of many who would profit by them and would wish to have copies in their possession.

Skin Surgery

Editor: ERVIN EPSTEIN, M.D., assistant clinical professor of medicine (dermatology), Stanford University Medical School, California. London: Henry Kimpton. 1956. Pp. 228. £2 16*s*.

THIS book is addressed primarily to dermatologists. It describes the techniques and indications for procedures, other than radiotherapy, required in the treatment of skin lesions.

At first, this work gives the impression that it is a "do-it-yourself" manual of minor surgery, but there are chapters on plastic work and extensive oral surgery which must be beyond the range of most dermatologists, and particularly those who turn to this book for guidance. Otherwise it describes methods which are practised at any centre where dermatologists are trained. Since the choice of method in any particular case calls for judgment, a book by twenty authors cannot be an entirely satisfactory substitute for discussion in the clinic with experienced teachers.

A Handbook of Ophthalmology (8th ed. London: J. & A. Churchill. 1956. Pp. 331. 30*s*.).—That this book, by Mr. Humphrey Neame and Mr. F. A. Williamson-Noble, has reached its 8th edition is a tribute to its popularity among undergraduates and general practitioners. It deals systematically with the commoner diseases of the eye and protecting structures, and two uncommon diseases of current interest—toxoplasmosis and retrolental fibroplasia.

We should perhaps mention, however, some passages which are not beyond criticism. With modern intra-ocular surgical technique there is no need to invite a patient to "look down" during operation, and indeed this can be dangerous during a cataract extraction; and an instruction to the patient to close her eyelids at the end of an operation before which orbicularis akinesia has been attempted is either an admission of failure or a request for the impossible. Illustrations of intracapsular cataract extraction show fixation forceps maintained on the eye during iridectomy and application and manœuvre of the capsule forceps. In the section on ptosis operations, a last-resort procedure is described first, and there is no mention of what many regard as the more rational operation of partial resection and advancement of the levator palpebræ superioris (modified Everbusch's operation) or of Dickey's operation. Also, it is time, we think, that the painful and unsterile practice of rubbing cocaine crystals on the conjunctiva was omitted from the textbooks.

Diseases of the Skin (11th ed. London: Henry Kimpton. 1956. Pp. 1479. £11).—The scope of this book, by Dr. Richard L. Sutton, jun., is encyclopædic. Innumerable references are appended to or incorporated in the text, and the 1972 excellent illustrations constitute a veritable atlas. A book which has survived for forty years and run to eleven editions clearly meets a need. As a source of up-to-date information on dermatological topics this work is unsurpassed, and the author lightens the text here and there by irrelevant excursions: peripatetic dermatologists will be gratified to learn that a crocodile can be made to let go by gouging its eyes.

Bronchologie (2nd ed. Vols. I and II. Paris: Masson. 1956. Pp. 1146. Fr. 14,000 the set).—The second edition of this work by André Soulas and Pierre Mounier-Kuhn has nearly twice as many pages as the first and contains 486 figures with 67 colour plates. It is a massive treatise on the anatomy and pathology of the bronchi, and on the techniques of bronchoscopy including the reproduction of the appearances of the bronchi by photography, cinephotography, and television. It is both an atlas of bronchoscopic appearances and a textbook of chest disease.

Medical Annual (Bristol: John Wright. 1956. Pp. 548. 38*s*. 6*d*.).—Sir Henry Tidy and Prof. Milnes Walker have continued their useful work of editing this annual, which is a perennial favourite of many. This year the index to new pharmaceutical preparations, already a valuable feature, has been expanded, and includes some hundred and seventy products introduced in the past twelve months.

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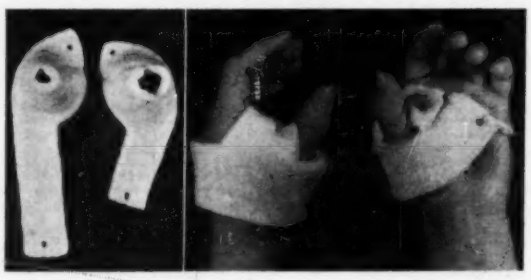

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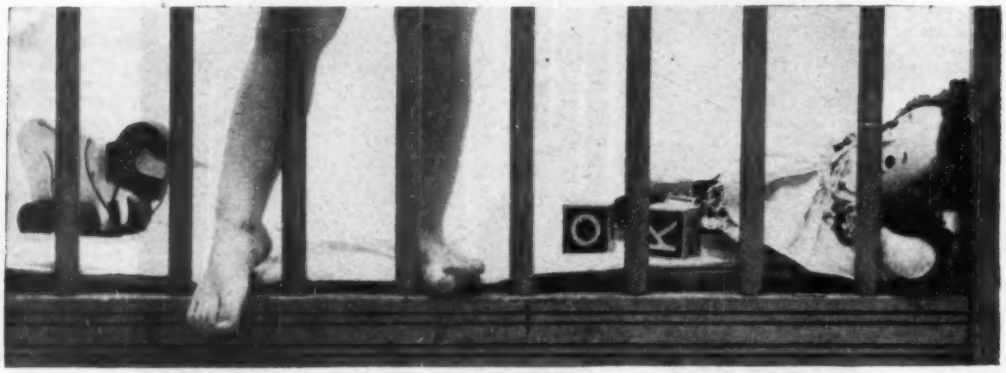

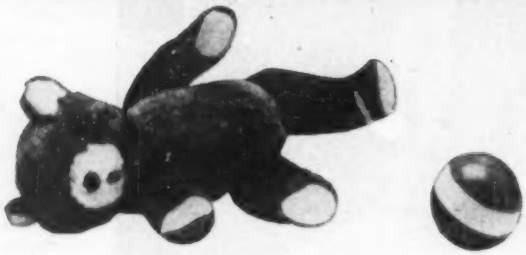

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THE LANCET
LONDON: SATURDAY, SEPTEMBER 1, 1956

X Rays and Leukæmia

WE publish this week an interim report of a survey of cases of malignant disease and leukæmia in childhood which suggests that these conditions are considerably commoner in children whose mothers have had X-ray examinations of the abdomen during pregnancy. The survey, arranged by Dr. ALICE STEWART and her colleagues in the department of social medicine at Oxford, is to cover some 1500 children under 10 years of age who died in England in 1953–55, and this report analyses information about the first 547 of them. Of these, 269 died of leukæmia and 278 of "other malignant diseases"; and the history of each has been compared with that of a control child. In the leukæmia group 42 of the mothers had had antenatal X-ray examinations of the abdomen, compared with 24 of the mothers in the control group; and in the "other malignant disease" group the total was 43, compared with a control figure of 21. Thus 85 of the mothers of the 547 dead children had had an abdominal X-ray examination in pregnancy, as against 45 mothers in the control group. (No details are given about the type of X-ray examination—i.e., screening, "straight" film, or pelvimetry.) These findings are particularly important because they constitute the first published epidemiological evidence of the hazards of diagnostic radiology to the patient (in this case unborn). As Dr. STEWART and her colleagues point out, any such effects are an addition to the presumed damage inflicted at the same time on the maternal and fœtal germ-cells.

This information comes at a time when the practice of diagnostic radiology is under review. Clearly, the use of X rays must now be considered in the light not only of probable genetic effects but also of definite harm to the individual fœtus, which becomes manifest after birth. Moreover, it raises again the question of the relation between ionising radiations and the production of leukæmia and neoplasms. Is radiation the sole cause; is the age of the tissue irradiated an important factor; how important is whole, as compared with partial, body irradiation; is a somatic mutation involved or does radiation merely fertilise the soil? The association between radiotherapy and leukæmia in adults with ankylosing spondylitis has lately been demonstrated,[1] and so has the connection between radiotherapy of the thymus and cancer and leukæmia in children.[2] In neither of these two surveys, however, were the control groups entirely satisfactory; and the only firm conclusion from them is that radiation in addition to natural background radiation can, and does, increase the incidence of leukæmia and tumours in man.

1. Court Brown, W. M., Doll, R. Medical Research Council Report. Cmd. 9780, 1956; p. 87.
2. Simpson, C. L., Hempelmann, L. H., Fuller, L. M. *Radiology*, 1955, **64**, 840.

(The circumstances of irradiation vary from diagnostic examination of the mother, through radiotherapy involving partial body radiation, up to the variable doses received in an atomic explosion.[3 4]) The few investigations so far reported have in fact shown not only the feasibility but also the difficulties of this type of work, especially in the selection of satisfactory control groups. This selection of controls is particularly important, since diseases such as leukæmia and cancer probably have multiple causes and the use of an unsatisfactory control group may mean that only one of the causes is identified and others are obscured. In the present survey it would be an advantage to know how many of the mothers had sulphonamides or antibiotics during pregnancy, so that this aspect may be compared with the figures for diagnostic radiology and deaths.

The value of approaching clinical problems epidemiologically is well illustrated by this work. The human epidemiological investigation, particularly when it can be allied with a clinical approach to the individuals in a survey, is a relatively new and extremely powerful means of research which has not yet been fully exploited. There can be very few investigators who would not prefer human data, however scanty, to the most detailed and voluminous animal data, which have to be extrapolated before they can be applied to man. In human epidemiology the use of field surveys is one of the most profitable methods of inquiry now opening before us, and one which can provide human data in abundance. Dr. STEWART and her associates at Oxford could not have got their important results without the help of members of the public-health service throughout the country, which has been given without stint; and if this type of investigation is to realise its potentialities it will need continued and wholehearted coöperation from all sections of the profession and of the community.

Hepatitis Virus Grown?

RECENT improvements in laboratory methods, and particularly in the use of tissue-culture techniques, have brought many new viruses into the virologist's net. Within the last few years measles,[5] chickenpox, and zoster [6] viruses, the group of viruses variously known as A.P.C., A.R.D.,[7 8] &c., and recently re-named adenoviruses, and the virus of primary atypical pneumonia [9] have all been cultivated in the laboratory; and although the common cold and rubella viruses seem so far to have slipped through the net, there are not many human pathogenic viruses still awaiting capture. One of the most important of these is the hepatitis virus, and a report suggesting that it may have been caught at last is therefore of great interest. RIGHTSEL et al.[10] have given a preliminary account of experiments in which tissue cultures were inoculated

3. Lange, R. D., Moloney, W. C., Yamawaki, T. *Blood*, 1954, **9**, 574.
4. Moloney, W. C., Kastenbaum, M. A. *Science*, 1955, **121**, 308.
5. Enders, J. F., Peebles, T. C. *Proc. Soc. exp. Biol., N.Y.* 1954, **86**, 277.
6. Weller, T. H., Coons, A. H. *Ibid*, p. 789.
7. Rowe, W. P., Huebner, R. J., Gilmore, L. K., Parrott, R. H., Ward, T. G. *Ibid*, 1953, **84**, 570.
8. Hilleman, M. R., Werner, J. H. *Ibid*, 1954, **85**, 153.
9. Liu, C., Eaton, M. D., Heyl, J. T. *Bull. N.Y. Acad. Med.* 1956, **32**, 170.
10. Rightsel, W. A., Keltsch, R. A., Tekushan, F. M., McLean, I. W. jun. *Science*, 1956, **124**, 226.

with materials containing hepatitis virus; and their results look promising.

In the first experiments, a single icteric serum, from a patient diagnosed as having infective hepatitis, was cultivated in different strains of human cells, maintained as continuous culture lines. A number of strains of spindle cells and epithelial cells of human origin showed no effect, but one strain of human epithelial cells known as the Detroit-6 strain showed unusual degenerative changes. The cell monolayer became disrupted and small dark granular cells appeared and tended to aggregate in clumps; the changes were focal and parts of the culture seemed normal. No inclusions were found. These changes were transmissible in series in Detroit-6 cells, but control cultures inoculated with serum from people who had not had hepatitis, or with fluids from uninoculated cultures, showed no such changes. The appearances were produced temporarily when passages were made in human amnion cells or in a strain of human epidermal carcinoma (HeLa) cells; but the changes could not be maintained in series, nor were any changes observed when cultures in Detroit-6 cells were inoculated into laboratory animals or fertile hen's eggs.

In further experiments, similar agents were isolated from 8 sera and 3 specimens of fæces from patients presumed to have had infective hepatitis. In all the ways in which they were tested, these different agents seemed to behave similarly, and in all of them rather low titres of infectivity were attained in the cultures. The agent was filterable and resisted heating at 60°C for thirty minutes—an important point since it was previously known from experiments with human volunteers that serum-hepatitis virus is very resistant to heat.[11] Sera from 7 people were examined for neutralising activity to the virus, and the only positive specimen was from someone known to have had hepatitis seven years previously. One sample of commercial gamma-globulin showed high neutralising activity and one sample did not. And, curiously, sera from 3 patients two to three months after the onset of hepatitis were cytopathogenic on their own when tested for neutralising activity, suggesting that virus was still present in these sera. RIGHTSEL et al. cautiously conclude that the virus-like agents which they have been studying seem closely associated with cases of human hepatitis, but they are unable to rule out the possibility that the viruses originated in some component of the tissue-culture system. Their caution seems justified by the many known examples of viruses latent in tissues which are activated by non-specific causes; but there is nevertheless enough experimental evidence in this paper to justify a little optimism.

One good reason for being cautious is that hepatitis viruses have resisted cultivation for so long. They have never been transmitted to any laboratory animals, including chimpanzees, and many claims to have grown them in pigs, birds, fertile eggs, and rats have remained unconfirmed; and so has the interesting report of a skin-test antigen for hepatitis.[12] It is only lately that a symposium[13] on the laboratory propagation and detection of the cause of hepatitis has pronounced the quarry a free agent. If RIGHTSEL et al. have in fact isolated the hepatitis virus, their success will be of immediate value, as well as holding out promise of future benefits. Almost certainly the first aim will be to see whether the related serum-hepatitis virus can be detected by this technique, and if it can, it should be possible to look for the virus in all blood and blood products for transfusions. Moreover, many important questions have to be answered about the serological relationships of the hepatitis viruses and the epidemiology of this group of infections; and a means of growing the viruses would be an enormous help. Finally, there is the prospect of a vaccine: the development of virus vaccines is such a rapid business nowadays that a vaccine now becomes a distinct possibility.

11. Oliphant, J. W., Gilliam, A. G., Larson, C. L. *Publ. Hlth Rep., Wash.* 1943, **58**, 1223.
12. Henle, G., Drake, M. E., Henle, W., Stokes, J. jun. *Proc. Soc. exp. Biol., N.Y.* 1950, **73**, 603.
13. Symposium on the Laboratory Propagation and Detection of the Agent of Hepatitis. National Academy of Sciences and National Research Council publication no. 322. 1954.

Cause of Death

A DISQUIETING situation as regards the availability of medical evidence in murder trials is disclosed by the case of The Queen *v.* Jordan, reported on p. 459. JORDAN, an American airman serving in this country, had stabbed a man in the abdomen during a café brawl. The victim was admitted to hospital, where operation was performed immediately; but eight days later he died, and JORDAN was charged with murder. At the trial, the cause of death was said to be bronchopneumonia following the stab wound, and the bronchopneumonia was interpreted as a natural consequence of the wound. JORDAN was convicted and sentenced to death. Shortly afterwards, the doctor who had treated the victim in hospital got in touch with the U.S. Air Force authorities, because he took a different view of the cause of death. As a result of his intervention, the case came before the Court of Criminal Appeal, which agreed to hear additional evidence. Two doctors then gave evidence to the effect that the bronchopneumonia was not the result of the stab wound but of the incorrect therapeutic use of oxytetracycline (terramycin) and of intravenous fluids. On this evidence, the appeal court quashed the conviction.

The first and obvious comment is that, but for the public-spirited action of the doctor concerned, JORDAN would have remained convicted of murder. Since the House of Commons voted some months ago to abolish the death penalty, persons convicted of murder have in fact been reprieved, so JORDAN would probably not have been hanged; but that would have been a largely fortuitous element in his escape, and he would certainly have remained in prison for a long time. Moreover, the question arises whether other men may not have been convicted and hanged through lack of adequate medical evidence. Clearly, the essential medical facts should have been presented to the judge and jury who originally tried the case. The judge did tell the jury that they must be satisfied that JORDAN had caused the other man's death by stabbing him; but on that point the jury had in substance the evidence only of the pathologist who made the post-mortem examination. It does not seem to have occurred to anyone that the bronchopneumonia which followed the injury might not have been a result of it. The Court of Criminal Appeal said that this was no reflection on the prosecution or the defence: "the circumstances were of a most unusual

character and it appeared to be one of those unfortunate cases which occurred without anyone being to blame." With great respect to the court, this is not entirely convincing. But, if those responsible for the prosecution and the defence were indeed blameless, then something must be wrong with a system under which it was possible to rely solely on the findings of the necropsy and to ignore the chance that other medical evidence might be significant.

This case should not be dismissed as an isolated one, in which things happily came out all right in the end. After all, though it had some highly unusual features, death following an unlawful injury is not all that rare. Nor is its importance limited to murder trials: similar considerations can arise in manslaughter cases, and they will probably arise in prosecutions for the newly created offence of causing death by reckless or dangerous driving. There is therefore ample reason for an official review of the handling of medical evidence in this type of case. An English criminal trial is conducted on what is often called the "adversary system"—that is, the calling of witnesses first by the prosecution and then by the defence, and the cross-examination of each witness by the opposing party. This system is generally regarded as the one most likely to elicit the truth; but the Jordan case shows that, in discussing the cause of death, the defence may be at a disadvantage where the victim has been treated in hospital. This places a special responsibility upon the prosecution to see that all potentially valuable medical information is available to all concerned. Any official consideration of this matter might well begin, therefore, with the procedure for collecting medical evidence.

Annotations

TUBERCULOSIS IN MIDDLE-AGED MEN

CAREFUL medical accountancy of chronic disease in a defined community is often rewarding, and some useful if disquieting observations are made by Caplin, Griffiths, and Silver [1] in the tuberculosis balance-sheet for 1949–54 which they present for a population of 143,000 in a north-east London area.

In part of their paper they compare the therapeutic results obtained in cases diagnosed in 1949, when chemotherapy was not readily available, with those obtained in cases diagnosed two years later when chemotherapy could be given almost immediately if required. Their 1949 group comprised 193 patients (84 with "positive sputum") of whom barely 1 in 5 received specific drug treatment (streptomycin and *p*-aminosalicylic acid) within a year of diagnosis and only 1 in 3 received it within three years. The 1951 group covered 144 patients (66 "positives"). Half of these were put on combined chemotherapy within a month of diagnosis, and 70% (including 91% of the positives) within a year. (Surgical and collapse therapy were used almost equally in the two groups; and isoniazid was used for both groups after the middle of 1952.) By the end of the third year after diagnosis, 13% of the 1949 group had died of pulmonary tuberculosis, compared with 8% of the 1951 group. Chemotherapy provides much of the credit side of the balance-sheet. But closer inspection of the mortality is revealing. In the first place the prognosis (as might be expected) proves to be considerably worse in patients with a positive sputum at the time of diagnosis. Secondly, Caplin and his colleagues find that it deteriorated quite strikingly with age.

In both groups the "over-45s," both men and women, show up badly. In the 1949 group, though 55% of the "positive" patients were under 45, 80% of the adult deaths were in patients over 45. In the 1951 group the corresponding figures were 62% and 75%. The proportion of patients aged 45 or over who died within three years of diagnosis was 36% (of 53) in the 1949 group, and 32% (of 28) in the 1951 group, and most of these deaths were in men. The poor prognosis in pulmonary tuberculosis among men over the age of 45 years stands out starkly. Of the more severe bilateral sputum-positive cases over that age in the 1949 series 88% were dead in three years—"a mortality worse than that of treated carcinoma of the bronchus" as the authors sadly remark, adding that "even with the earlier drug treatment in the 1951 series 50% were dead" after the same period.

Therapeutically speaking, 1949 is perhaps medieval history, and north-east London is a comparatively poor part of the Metropolis. What then of the rest of London? Hewitt [2] in a study of mortality from respiratory disease in the London boroughs between 1950 and 1952 observes that though the total deaths during this period were not excessive by national standards, a breakdown by sex and age suggests that there were in fact some thousands of "extra" deaths among males generally, and in particular among the 45–64 age-group. The outstanding feature of this analysis by cause of death was the emergence of an excess, increasing rapidly with age, in the deaths from respiratory diseases including tuberculosis, and there were several London boroughs which fared worse in this respect than the area of Bethnal Green and Hackney dealt with by Caplin and his associates. Reviewing the state of tuberculosis in the whole of the county of London (population 3,320,000) during 1954, the medical officer of health [3] showed that a third of the male population, and 26% of the 35,000 cases of pulmonary tuberculosis on the registers of the chest clinics, were 45 years of age or older. In this age-group the prevalence of the disease was 12 per 1000 men and 3 per 1000 women. Mass radiography of Londoners during 1954 covered approximately 7% of the adult population, and it was estimated that 5 per 1000 of the men (all ages) examined, and 3 per 1000 of the women, had active pulmonary tuberculosis. In the age-group 45–64 years, the corresponding figures were 9 per 1000 men and 2 per 1000 women, while at 65 or over nearly 20 per 1000 men and 3 per 1000 women had active disease. During 1955 42% of all male pulmonary cases newly notified were in men over the age of 45, and this sex and age group provided the highest incidence-rate of 1·8 new cases per 1000. Of the 517 deaths in the county attributed to pulmonary tuberculosis, 392 were in men and 87% of these were in men of 45 or over.

A predominance of male deaths in elderly phthisics has been a feature of London tuberculosis mortality for many years, and in the middle-aged and elderly male Londoner, pulmonary tuberculosis is clearly still a prevalent and serious disease. The infective hazard of unrecognised (and even of known) active cases in this group, living with children or working with young adults, constitutes a pressing public-health problem. The possible means of improving both ascertainment and treatment need to be considered. We also need to know why in middle age the long-quiescent and apparently healed pulmonary lesion breaks down so much more readily in men than in women.

1. Caplin, M., Griffiths, J. J., Silver, C. P. *Tubercle, Lond.* 1956, 37, 233.
2. Hewitt, D. *Brit. J. prev. soc. Med.* 1956, 10, 55.
3. Scott, J. A. Report of the County M.O.H. for 1954. London, 1955.

INSULIN-NEUTRALISING ANTIBODIES

IF insulin resistance is defined as the condition in which more than 200 units of insulin are required per day for at least forty-eight hours in the absence of acidosis,[1] then the number of recorded examples is quite small. Davidson and Eddleman [2] reviewed 50 such cases and described 1 from their own experience. The number of diseases complicating the diabetes was so great that it was very doubtful whether they were related to the cause of the insulin resistance. 17 of the 50 patients showed overt insulin allergy, but in the 10 of these 17 in whom suitable tests were made, insulin-neutralising antibodies were found in only 3. The lack of correlation between the formation of allergy-producing antibodies (reagins) and antibodies neutralising the hypoglycæmic action of insulin was further illustrated by the finding of insulin allergy in only 5 of the 8 patients with insulin-neutralising antibodies; and this has been confirmed by others.[3 4] Sera from 26 of the 50 patients were tested for antibodies which protected mice or rabbits against the action of insulin on the blood-sugar, and in only 8 were such antibodies unequivocally present. It is, of course, possible that antibodies fixed in the tissues [5] were partly responsible for the insulin resistance in some of the negative cases.

Various techniques have been developed to detect and measure insulin-neutralising antibodies: these include the protection of mice [4] or rabbits [6] from insulin-induced hypoglycæmia; precipitin tests [7] (or measurement of the precipitins by the agglutination of collodion particles coated with insulin in the presence of dilutions of anti-serum [8]); and hæmagglutination methods [9] or glycogen-uptake studies on the rat diaphragm.[10] Whichever of these methods is used, the results have to be interpreted in relation to the dose and the timing of the insulin given to the patient; for the highest concentration of free insulin-neutralising antibodies is not unnaturally to be found when little insulin has recently been administered.[11]

The anti-insulin factor in the blood was identified with the plasma-globulins by Banting and his colleagues [12] in 1938. De Filippis and Iannaccone [13] showed that the anti-insulin factor in their patient was in the euglobulin fraction; and Kaye and his co-workers [14 15] in Montreal used a zone-electrophoresis technique to detect insulin-neutralising activity in the gamma-2 fraction of the plasma-globulins in a patient with resistant diabetes. Colwell and Weiger [11] studied an interesting diabetic patient with hæmochromatosis in whom an insulin requirement reaching 11,400 units a day was associated with hypergammaglobulinæmia. The anti-insulin activity resided in the gamma-globulins and apparently in certain specific gamma-globulins; for most diseases associated with hypergammaglobulinæmia, such as cirrhosis, are not accompanied by insulin resistance. This association of raised plasma-globulin levels with insulin resistance in rare cases of diabetes provides conditions in which it is logical to use corticotrophin (A.C.T.H.) or cortisone to depress the formation of the excess globulins. Successful use of such treatment was first reported by Howard [16] and has been repeated by others,[17] including Colwell and Weiger,[11] who demonstrated that there was a fall in insulin needs during and after corticotrophin treatment. This fall was accompanied by a decrease in the concentration of plasma gamma-globulin and of serum insulin inhibitor. Thus, corticotrophin or cortisone, which can produce insulin resistance, as in Cushing's syndrome, leads to a paradoxical increase in insulin sensitivity. If specific insulin-neutralising antibodies can account for some cases of insulin resistance in diabetics and can cause diabetes in normal mice,[18] the same mechanism may be able to cause diabetes in people with a more moderate insulin requirement. There is, however, no evidence that this is so, and indeed insulin-neutralising antibodies have been detected in non-diabetic patients, such as schizophrenics given insulin-shock treatment.

1. Root, H. F. *New Engl. J. Med.* 1929, **201**, 201.
2. Davidson, J. K., Eddleman, E. E. *Arch. intern. Med.* 1950, **86**, 727.
3. Goldner, M. G., Ricketts, H. T. *J. clin. Endocrin.* 1942, **2**, 595.
4. Lowell, F. C. *J. clin. Invest.* 1944, **23**, 233.
5. Gordon, A. S., Kleinberg, W., Charipper, H. A. *J. exp. Med.* 1939, **70**, 333.
6. Glen, A., Eaton, J. C. *Quart. J. Med.* 1938, **7**, 271.
7. Lerman, J. *Amer. J. med. Sci.* 1944, **207**, 354.
8. Cannon, P. R., Marshall, C. E. *Amer. J. Path.* 1941, **17**, 442.
9. Stavitsky, A. B., Arquilla, E. R. *Fed. Proc.* 1953, **12**, 461.
10. Marsh, J. B., Haugaard, W. *J. clin. Invest.* 1952, **31**, 107.
11. Colwell, A. R., Weiger, R. W. *J. Lab. clin. Med.* 1956, **47**, 844.
12. Banting, F. G., Frank, W. R., Gairns, S. *Amer. J. Psychiat.* 1938, **95**, 562.
13. De Filippis, V., Iannaccone, A. *Lancet*, 1952, i, 1192.
14. Kaye, M., McGarry, E., Rosenfeld, L. *Diabetes*, 1955, **4**, 133.
15. Schon, A. H., Kaye, M., McGarry, E., Rose, B. *J. Lab. clin. Med.* 1955, **45**, 765.
16. Howard, J. E. Proceedings of the 2nd Clinical A.C.T.H. Conference. New York, 1951; p. 327.
17. Collens, W. S., Banowitch, M. M. *Metabolism*, 1955, **4**, 355.
18. Moloney, P. J., Coval, M. *Biochem. J.* 1955, **59**, 179.
19. Humble, J. G., Jayne, W. H. W., Pulvertaft, R. J. V. *Brit. J. Hæmatol.* 1956, **2**, 283.

THE LYMPHOCYTE: FRIEND OR FOE OF THE MALIGNANT CELL?

MOST people look upon lymph-nodes and lymphocytes as part of the body's defences against the spread of malignant disease, and upon the appearance of metastases in lymph-glands as a "holding up" process. Some recent observations by Humble, Jayne, and Pulvertaft [19] suggest that there may be an alternative, and very different, explanation. They studied the interaction between lymphocytes and other cells when observed in serum-agar cultures—a sort of tissue-culture in which the cells are free to move between the plane surfaces of the agar below and a glass coverslip above. The material to be studied was obtained from bone-marrow, malignant tissue, lymph-nodes, and exudates of murine and of human origin. The changes in the cells were recorded by slow cinematography.

In these preparations lymphocytes pass freely about the surface of the agar until they encounter a malignant cell, a megakaryocyte, or a cell in mitosis, when they exhibit some typical changes of behaviour. Lymphocytes do not seem to be attracted by these cells, as polymorphs are attracted to bacteria; it is only on actual contact that they cease their random wandering. Several different types of behaviour have been observed. The lymphocytes may move freely round the perimeter of a malignant cell for hours at a time, and several lymphocytes can be seen circling a single malignant cell in this way. In other cases the lymphocytes seem to become attached to the surface of the other cell, and photographs show several lymphocytes fixed in this way to carcinoma cells. Megakaryocytes also show lymphocytes apparently permanently attached with 12 or more superimposed on their surface. A very odd phenomenon is the appearance of lymphocytes actually inside malignant cells; the accelerated cinema film shows that the nucleus of the host cell is pressed to one side by anything from one to a dozen lymphocytes slowly circulating within the margins of the malignant host cell. The lymphocytes seem to be alive and functioning, and none of the other types of cells that occur in cultures have been seen inside cells in this way. Humble and his colleagues call the phenomenon "emperipolesis"—"inside roundabout wandering." Some cells from the sternal marrow of a patient with acute myeloid leukæmia and from a lymph-node of a patient with reticulosarcoma showed this phenomenon.

Lymphocytes behave characteristically when they come into contact with a mitotic cell, and photographs

illustrate the behaviour with megaloblasts. "Until the megaloblasts began to divide, lymphocytes wandered at random around the megaloblasts, showing no affinity for them, and wandering away again when they made contact. As soon as a megaloblast has entered into mitosis, and the stage has been reached where only a small bridge of cytoplasm unites the daughter cells, a lymphocyte is seen to dive upon them and to cross exactly midway. This behaviour is too often seen to be accidental; it produces a ludicrous appearance of the cutting of an umbilical cord. When it is appreciated that in many preparations there are comparatively few lymphocytes, that in all cases the preparations only thrive if the cells are well flattened out and separated, and that the zone of circulation of an individual lymphocyte is small, the frequency of this phenomenon indicates a purposive, concentrated and probably essential function."

Lymphocytes thus show a remarkable affinity for malignant cells and for cells in mitosis—that is, for actively growing and dividing cells. Humble and his colleagues suggest that the lymphocyte is a "mobile source of enzymes or metabolites which are particularly in demand by actively growing and dividing cells." If this is so, malignant cells accumulate in lymph-nodes because, when they are brought there by lymphatic or blood channels, they find a site particularly suitable for their growth and multiplication. So the lymphocyte "functions in malignant disease as an agent hostile to the interests of the host since normally it furthers the growth and division of cells, regardless of their nature." Humble et al. note that in their serum-agar preparations 90% of the cells from inoculated primary tumours died within the first hour, whereas in preparations from secondary growths in bone-marrow or lymph-nodes 90% of the malignant cells survived. Another point they mention is that radiotherapy is known to cause a diminution in the number of lymphocytes in the blood and this may help, not hinder, the cessation of malignant growth.

The cultures in which these phenomena have been observed are, like all cultures, artificial affairs; they differ mainly in that the cells are under some pressure from the superimposed coverslip. Changes in the lymphocytes like those described have not been observed in fibrin-clot cultures on slides or in roller tubes. But that does not mean that the observations are incorrect; they are of much interest, and the ideas they stimulate about the function of the lymphocyte deserve further exploration.

THE ANTERIOR TIBIAL SYNDROME

In its acute form the anterior tibial syndrome is now clearly recognised. Severe pain in the front of the leg after exercise is associated with a firm swelling of the dorsiflexors of the ankle and weakness or complete paralysis of these muscles. Barham Carter et al.[1] described 9 patients with this syndrome in 1949. They regarded the condition as one of primary swelling of the muscles within the anterior fascial compartment of the leg, producing secondary ischæmia. The anterior tibial nerve was often affected, and there was also paralysis of the extensor digitorum brevis and anæsthesia of the first interdigital cleft. The necrosis of the muscles was rarely followed by shortening—a feature distinguishing the condition sharply from Volkmann's contracture. Hughes[2] described 3 cases of this type. After an investigation of the blood-supply of the anterior compartment of the leg, he concluded that spasm of the anterior tibial artery was the most likely cause of the ischæmia. It is generally agreed that the larger vessels do not undergo permanent changes. Most surgeons would treat the condition by decompression of the anterior tibial compartment, although few cases have been recognised early enough to assess the merits of this operation.

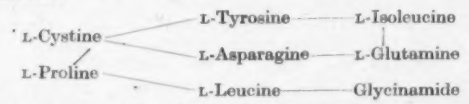
Mavor[3] has lately identified what he takes to be a chronic form of this condition. His patient, a footballer, had pain in the front of the calf after exercise. There was no evidence of circulatory disorder, but two small muscle herniæ were present over the upper part of the anterior tibial muscles on each side. After excision of the fascia over this muscle, the defect was repaired by a graft of fascia lata, and the patient's symptoms subsided. Biopsy of the tibialis anterior showed no evidence of necrosis, and the diagnosis must remain uncertain. Nevertheless, there can be little doubt that attacks of pain in this region are common among athletes in training, who refer to them as "shin splints." Whether they ever precede an acute attack is not clear, but muscle tenderness and swelling and redness of the overlying skin may all be present and subside with rest. The reluctance of athletes to seek medical advice when difficulties arise during training may account for the absence of recorded accounts of this chronic form. Thus, Woodward[4] says "the only answer is to build up the tone of the muscle more gradually and the pain will die away." But were this unsuccessful, decompression of the anterior tibial compartment might be undertaken.

OXYTOCIN

The completion of chemical investigations of one of the polypeptide hormones of the posterior pituitary gland was recognised this year by the award of the Nobel prize for chemistry to Prof. Vincent du Vigneaud, of Cornell University Medical College, New York.

du Vigneaud's group have isolated, determined the structure of, and synthesised, oxytocin, the hormone responsible for uterine contraction and milk ejection.[5,6] The isolation of the factor was in itself a notable achievement, since the material is present in minute quantities in the gland and is unstable; and each stage of purification had to be controlled by tedious and time-consuming bio-assays. Starting from some hundreds of thousands of hog and beef glands, the hormone was eventually isolated in an apparently homogeneous form by the techniques of counter-current distribution and electrophoresis.

Total hydrolysis yielded a mixture of eight amino-acids and ammonia; further degradative studies revealed that the components were arranged in peptide linkage as follows:



An important biological and chemical property is the reversible opening of the 20-membered ring by reduction of the –S–S– link of cystine to the –SH HS– form (i.e., cysteine residues).

The synthesis was accomplished by condensing the protected tetrapeptide of cysteine-proline-leucine-glycinamide with the tripeptide isoleucine-glutamine-asparagine and then the product with the protected dipeptide cysteine-tyrosine. Reductive removal of protective groupings gave the open chain (–SH HS–) form of the hormone, and aeration in aqueous solution at neutrality gave natural oxytocin. The synthetic hormone had every chemical and biological property shown by the natural

1. Carter, A. B., Richards, R. L., Zachary, R. B. *Lancet*, 1949, ii, 928.
2. Hughes, J. R. *J. Bone Jt Surg.* 1948, **30B**, 581.
3. Mavor, G. E. *Ibid*, 1956, **38B**, 513.
4. Woodward, C. Sports Injuries. London, 1954.
5. du Vigneaud, V. *Science*, 1956, **123**, 967.
6. du Vigneaud, V. Symposium on Peptide Chemistry, Chemical Society. London, 1955; p. 49.

peptide, and also showed very slight avian depressor, pressor, antidiadnuretic activity. These last three properties are shown to a high degree by another posterior pituitary hormone, vasopressin, which conversely has traces of oxytocin activity. As might have been expected, the hormones are chemically similar, the leucine and isoleucine residues of oxytocin being replaced by phenylalanine and arginine in vasopressin. The 20-membered ring is again present and can be reversibly opened by mild reduction.

This 20-membered-ring type of structure is also present in insulin,[7] and du Vigneaud[8] feels that, although the insulin molecule is of a higher order of complexity than that of oxytocin, insulin, too, may be synthesised in the future. Furthermore, the antibiotic tyrocydin A also contains a large polypeptide ring,[8] as does actinomycin D,[9] in which the ring is attached to a heterocyclic ring system (phenazine).

COMPOSTING

THE use of human and animal excreta to increase the fertility of the land is a custom older than history. Mixed with vegetable matter they add humus to the soil, and, thanks to S. A. Waksman, we now know something of the scientific basis of this traditional practice. It would clearly be sound economy to turn to this purpose the urban nitrogenous wastes which are now discharged improvidently into the all-engulfing sea.[10] The Borough of Southwark and the County of Dumfries have been pioneers of large-scale composting in this island and have little reason to regret their ventures. A recent monograph from the World Health Organisation suggests that there are few countries where similar or more ambitious projects are not under trial or already established.[11] It is an admirable book which, after a clear exposition of the principles of bacterial digestion, illustrates their application on a small as well as on a large scale. There is even a chapter on the production of methane for heating or lighting as a by-product of the communal village latrine. But the author (and others who have written on the same subject) would perhaps carry a little more conviction if he gave more attention to the objections to this process. Municipal authorities and farmers are those primarily interested. The former seldom neglect any source of income for the benefit of the ratepayers; the latter welcome any source of profitable fertility. But there are in fact grave mechanical and financial impediments to the wide use of composted town wastes. These will be overcome in time, and when this economical practice has become the rule we shall have reason to be grateful to the quasi-religious fervour of its champions. (That is if we survive so long. Some of the more inflamed disciples of the compost-heap prophesy our speedy end from murrains and want, if we continue to poison our fields with almost pure chemicals. So far the figures of the Registrar-General do not support this thesis.)

As doctors we are mainly concerned with the risks to health arising from using as a fertiliser fæces which may contain pathogenic bacteria or helminth ova. A major claim for composting is that the heat evolved is lethal to these; and if the practice were adopted in those countries where night-soil is used on the growing crops—and that includes a large part of rural England—the inhabitants would no longer be martyrs to worms or worse. Undigested fæces among the growing lettuces is such an obvious source of infection that the reformers have looked no further. Yet there is evidence that the most foully polluted water may be used for irrigating crops almost with impunity.[12] Those races most plagued by intestinal infections and infestations have other more intimate habits than the use of night-soil which may explain a part of their misfortune. If they are to be persuaded to compost their excreta they must be given a reasonable quantitative estimate of the benefits to be expected. Equally it would be unwise to put too much trust in the freedom of composted excreta from all pathogenic parasites. Such a claim may be made quite fairly for the produce of a large mechanised plant, but the smaller the scale of operations the less likely is the kill to be complete. From the nature of the material it will be difficult to devise a process as efficient as a milk-pasteurising plant—which have been known to fail. And one typhoid bacillus in the wrong place can probably initiate an epidemic.

7. Sanger, F., Thompson, E. O. P. *Biochem. J.* 1953, **53**, 353. Sanger, F., Tuppy, H. *Ibid*, 1951, **49**, 463. Sanger, F., Smith, L. F., Kital, R. *Ibid*, 1954, **58**, vi.
8. Paladini, A., Craig, L. C. *J. Amer. chem. Soc.* 1954, **76**, 688.
9. Brockmann, H., Bohnsack, G., Franck, B., Gröne, H., Muxfeldt, H., Süling, C. *Angew. Chem.* 1956, **68**, 70.
10. *Lancet*, 1954, ii, 1315.
11. Composting. By HAROLD B. GOTAAS. *World Hlth Org. Monogr. Ser.* 1956, no. 31. World Health Organisation: Geneva. (Obtainable from H.M. Stationery Office, P.O. Box 569. London, S.E.1.) Pp. 205. 25*s*.

THE HUNTERS' HOUSE

AN opportunity has come to acquire and preserve the house at Long Calderwood, East Kilbride, Lanarkshire, where William Hunter was born in 1718 and his brother John ten years later. It is, as our picture shows, a plain Scots farm-house, typical of its period. It is still

occupied; but the fabric, particularly the floors and woodwork, is in urgent need of repair.

A committee, representing the East Kilbride Development Corporation, the University of Glasgow, the Royal Faculty of Physicians and Surgeons, and the Western Regional Hospital Board, has been set up to raise enough money to repair the house and to endow it. £3500 is needed urgently for repairs and of this nearly £3000 has already been raised in Scotland. The committee is now crossing the Border and appealing to doctors everywhere to help it to raise another £17,000 to form an endowment fund. It plans to have a board of trustees to maintain the house as a memorial, a museum, and a possible research centre.

The medical members of the committee are Prof. G. M. Wishart, Prof. J. D. Mackie, Prof. Stanley Graham, Prof. Andrew Allison, Mr. Walter Galbraith, Mr. Alexander Miller, and Dr. Alexander Smith (hon. secretary). Donations should be sent to the hon. treasurer, Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2.

12. Rudolfs, W., Falk, L. L., Ragotzkie, R. A. *Sewage industr. Wastes*, 1951, **23**, 253.

Special Articles

PSYCHOTHERAPY IN GENERAL PRACTICE *

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MANY think that psychotherapy should be undertaken only by the specialist. I disagree with this, and hold that the person best placed to use psychotherapy, and most likely to use it effectively, is the general practitioner.

When people feel themselves to be ill they usually turn first to their family doctor. Before anybody else, he has a chance to recognise the nature of the illness, to choose the treatment, and to apply the treatment if it is within his competence. His attitude may influence not only the course of the illness but also perhaps the course of the patient's life.

We have all heard hair-raising stories of how patients have been treated as neurotics when in fact they were suffering from a cancer or some other form of physical disease. I believe, however, that at least as much harm may be done by accepting all presenting symptoms at their face value and by treating them with physical methods. In this way the patient who has an emotional conflict may be encouraged in his false belief that he has a physical illness. With a psychotherapeutic approach there is less danger of this happening, and psychotherapy, when needed, can be started without delay. This is important; for many patients are disinclined to consult a psychiatrist—let alone be treated by one. In any case, there is no necessity to refer all patients requiring psychotherapy to psychiatrists, even if there were enough psychiatrists to give it.

WHAT KIND OF PSYCHOTHERAPY?

By psychotherapy I do not mean any one specific treatment. There are many forms of psychotherapy, and in the first place they may be conveniently divided—as surgery is divided—into major and minor branches.

Major psychotherapy includes psycho-analysis, narco-analysis, hypno-analysis, and other forms of intensive psychotherapy, and clearly would be used only by the specialist, and possibly by those few general practitioners who have had a personal training analysis. I am not here concerned with these methods.

Minor psychotherapy may be divided into two further groups of methods. The first includes the following:

Simple reassurance, either alone or after examination has excluded physical disease.

Reassurance together with prescribing of placebo.

"Education," or explanation about some medical problem previously the basis of anxiety symptoms.

Sympathetic listening to the expression of difficult reality situations, or of resentments, discontent, aggressive feeling, &c., without any show of reproach or condemnation.

Support and encouragement to continue in the face of difficulty.

Guidance towards a happier and fuller use of leisure, and to the development of new hobbies and pastimes. Suitable books may be recommended for reading.

The bedside manner might also be placed under the heading of minor psychotherapy, and there must be many other forms of this art.

I do not doubt that these methods are used by all doctors in their day-to-day dealings with their patients—even by those who do not care to accept any connection with the word psychotherapy. The only doctor who can continue his work without using some form of psychotherapy is the one who confines himself to the study of the dead.

* Based on a paper read at a joint meeting of the North London and East London faculties of the College of General Practitioners on May 13, 1956.

But these methods have one thing in common—they do not attempt to deal with the underlying emotional problems any more than the more usual physical treatments, though they do allow the doctor a fuller understanding of the patient as a whole person and not merely as the vehicle for an illness with symptoms.

The second group of methods of minor psychotherapy are more advanced but are still within the competence of any family doctor. They are consciously and deliberately applied with careful thought and attention to what is going on between the patient and doctor. The aim is to focus the patient's attention on his mind, thereby helping him to understand his particular problems so that he can either find a way of resolving them, or, if this is impossible, of adapting his way of life to fit in with them.

These methods consist in discussing his problems with the patient in such a way that underlying emotional conflicts can be related to them. Where the patient denies problems, or is clearly unaware of any conscious worry, it is necessary to centre discussions on the life situation at the time of onset of symptoms, or even of the whole life-history, in order to discover possible motivation for his present-day behaviour and the development of his symptoms.

Essentially the aim is to encourage the patient to do the talking—the reverse of normal medical history-taking—for the relevant material is in the patient's mind, and only the patient can produce it. It is surprising how often in this way possible solutions to the underlying emotional problems are found by the patient himself. Repeated description of the symptoms should be gently discouraged, and the discussion directed to what lies behind the symptoms. We do not necessarily want to know why the patient has a symptom, but rather what does he do with it or what does it do for him?

PREVENTIVE PSYCHOTHERAPY

I tend to concentrate on the younger patients, because response does seem to diminish with age—though, when time permits, success may be expected in many of the older ones, and particularly in women at the climacteric.[1] But another reason for treating the young is that if they are enabled to cope with their own emotional problems they will be less likely to produce neurotic illnesses in their children. The family doctor is in a wonderful position to practise true preventive medicine along these lines. We all know how the infant and the child respond to an over-anxious parent, and one of the best rewards that I know is to see the change in the infant or child after simple psychotherapeutic measures have been applied to the mother or father. Similarly the girl at onset of menstruation will benefit if her mother's faulty attitudes to sexual matters are corrected. Even the problem of failing lactation and breast-feeding can often be solved by a combination of reassurance, lessons in the elementary physiology of lactation, and discussion of the mother's feelings of inadequacy or guilt.

SYMPTOMS OF WHAT?

We family doctors should train ourselves, I think, to accept that people come to us only when they need help and therefore should not be regarded as "just neurotics" or as nuisances. We should recognise that their symptoms may be masking emotional conflicts, and that it is these conflicts that need our attention—not the symptoms. We would then be in a position to try to deal with the causes rather than the effects. To return to the surgical analogy, none of us would think of treating abdominal pain without first diagnosing its cause: if it were found to be due to acute appendicitis we should hardly be content only to prescribe morphine. Yet it is commonplace in medical practice to diagnose anxiety, and then to treat this symptom—with some sedative or

1. Hopkins, P. *Trans. Hunter. Soc.* 1954, **13**, 90.

"tranquilliser"—without having made any effort to uncover its origins.

If to the number of patients with psychoneurotic illness we add the even larger numbers of those with psychosomatic (or stress) disorders, it becomes positively alarming to contemplate the extent to which our prescriptions are expected to act as substitute for the fuller understanding and the psychotherapeutic discussions the patients need.

In 1951 I carried out a survey in my practice and found that 42% of my patients were suffering from stress disorders.[2] Later I read Stephen Taylor's statement[3] that "claims that as many as a third of the G.P.'s patients are suffering from neurotic illness appear to have arisen mainly because organic complaints have not been diagnosed." I almost gave up practice. But instead I made a careful analysis of all the patients I had referred to hospital specialists and consultants during 1951–53. I was relieved, though not surprised, to find that, after full investigations, slightly over 30% were found to have psychoneurotic or psychosomatic disorders.[4]

Here then is evidence of the scope for psychotherapy in general practice. If more is needed, one has only to turn to any newspaper or magazine, or even to the wireless and television, to see the amount of help that is forever being sought by the public for their emotional problems.

TIME WELL SPENT

Shortage of time is the reason most commonly given for limiting psychotherapy in general practice. Admittedly psychotherapy takes time; but in my experience this is time well spent, and in the long run may even be time saved. A few sessions for psychotherapy may take up less time than seeing a patient for a few minutes, to prescribe a placebo, every week for months or years.

The following examples show how minor psychotherapy may be applied in general practice.

Mrs. A.B., aged 25, with her tear-filled eyes, would be recognisable to everyone, especially with her opening remarks: "I think I need a tonic, doctor, I feel so run down." On being asked what had made her run down and in need of a tonic she burst into tears, and after some silent sobbing she told me how miserable she felt. She had been married only a few weeks, yet already she was so tired of working all day in her office and then returning to clean her flat and prepare her husband's supper. On the word husband she again flooded with tears; after which, with little persuasion, she went on to tell me about difficulties she was experiencing with sexual intercourse. It was not difficult to help her with a full discussion, and when I saw her again two weeks later all was well—though she was still working all day at the office and still doing her housework. It is over a year since the first interview, and she remains well, and happy.

It may be argued that to prescribe a tonic might have had the same effect. Perhaps this is so, but I do not believe it. But here is a patient who had been given tonics without effect.

Mrs. B.C., a 27-year-old social worker, had moved to London with her husband. She came asking for a further supply of a well-known tonic that her previous doctor had prescribed. On being asked if it had helped she replied that it had not helped yet, but as she felt so run down and so tired she was sure she should go on taking it. She had come during a busy surgery, so I was glad to give her the prescription; but I also gave her an appointment for a full examination two weeks later. At this next interview she was no better, and told me of her symptoms—giddy and faint feelings, breathlessness on stairs, and being jumpy and nervy. She had been off work for several months in 1947 with pulmonary tuberculosis: but examination was completely negative, apart from revealing her to be tense and anxious, and with all reflexes grossly exaggerated. We discussed her marriage, her work, and eventually her feelings of insecurity due to her husband's insecure position as a student of architecture. She recalled that she felt insecure when she had similar symptoms with her chest trouble. After a full discussion I was able to reassure her that she did not need a tonic any more. She rapidly lost her symptoms after this.

I believe that in both these patients the repeated prescription for tonics could have encouraged a life-long habit of taking medicines, with frequent visits to the surgery and the development of illnesses at any and every crisis.

The next two patients are men, and it was necessary to encourage both to talk freely about themselves before the true nature of their illnesses became apparent.

C.D., a stockbroker's clerk, aged 52, first came to me on April 17 complaining of a "constant dullness in the pit of the stomach" for more than 20 years. He now feared that he had a gastric ulcer "or something worse." He had taken many medicines over the years with little benefit. When I asked him to tell me more about his trouble he expressed surprise, saying that at that point other doctors just gave him a prescription, adding that "his stomach was the trouble." With encouragement, however, he described the work he disliked so much; he bemoaned the fact that he had never married; he even talked of feeling as though he was "full of frustrations"; and he lamented that he had never fulfilled his ambition to be a writer. Once he started, I did not have to ask any questions and I found myself wondering what on earth anyone could do to help this poor chap. Examination revealed only anxiety. I told him of my negative findings—and I added that there was definitely no evidence of an ulcer nor of cancer of the stomach. On the other hand, I went on to tell him that there was the positive finding of his anxiety about his physical condition together with an underlying depression about his self-expressed frustrations. We went on to discuss some of the ways in which he might make his life more interesting, and I prescribed some sedative tablets. He returned on May 1 to tell me how much better he had felt. I was taken aback, but managed to say that I was glad the tablets had helped, to which he replied he had only taken one of them, and as it had made his mouth so dry he had left the rest. He said he had been relieved to know he had no ulcer or cancer, and that after our talk he had joined a local club and felt he belonged somewhere at last. He is also taking a course in night classes on journalism.

D.E., aged 23, a surveyor, complained of constipation for a month associated with what he took to be hæmorrhoids. He said that otherwise he was well. My attempts to find out why he should have become constipated a month ago were fruitless. Local treatment and dietary advice was given when he was found to have early hæmorrhoids. Two weeks later these had cleared, but he looked upset, and under a little pressure he admitted to not being able to sleep for the past three months. He could not account for this. In his brief account of his life I found nothing suggestive of an unstable neurotic personality, and it was not until I asked him whether he had any girl friends that he told me that about six weeks ago he had broken off his engagement. At first he tried to say this was a "lucky escape," but gradually he told me how, when away on business, he had been unfaithful to his fiancée and later developed what turned out to be a non-specific urethritis. This preceded his insomnia, and the constipation had started when he began to wonder whether he might pass some venereal disease to his fiancée by kissing her. He avoided being alone with her and eventually decided to break off the engagement. I pointed out to him the possible relation between the events and his symptoms, and he agreed that he should tell his fiancée the truth about everything. A week later he was able to say that his fiancée had forgiven him and that all was now well. In his own words: "It's incredible. I feel 100% fit now—and I've been sleeping normally."

This case shows that we cannot believe the patient who tells us in the first interview that he has no worries. He really may believe this, or he may not yet be sure whether he can talk freely to us.

To return to women patients, many gynæcological disorders respond well to psychotherapy, which in my opinion should be tried before hormones and anything more drastic. Young women with amenorrhœa due to environmental or emotional stress usually respond to

2. Hopkins, P. *In* Modern Trends in Psychosomatic Medicine. Edited by D. O'Neill. London, 1955.
3. Taylor, S. Good General Practice. London, 1954.
4. Hopkins, P. Awaiting publication.

simple psychotherapy. Women with menorrhagia not associated with fibroids or other physical disease also do well with simple psychotherapy. The emotional ætiology of dysmenorrhœa is recognised, yet it is odd that psychotherapy is seldom used in its treatment.

Miss E.F. is a shop assistant of 24, who because of pain had spent one or two days in bed at every period since the age of 14. Her periods were irregular, 5–9 weeks apart, and were preceded for 2–3 weeks by severe headaches with feelings of tension. She had had every kind of treatment in the books —except psychotherapy. There had never been any relief from either the premenstrual tension or the pains. Over a number of interviews she was able to discuss her attitude to her bodily functions and to sexual matters, and she described the tremendous guilt she felt at the age of 14 when a boy friend tried to make love to her. Shortly after this her father had died, and her next period was painful and set the pattern for subsequent periods. There were many conflicts associated with her attachment to her mother, her genuine religious beliefs, and her feelings for the boy friend, who has remained faithful to her to this day. After the third interview she began to improve, and for the past 8 months she has been menstruating regularly and has been free from all symptoms. More important, she has matured and is soon to marry her friend.

This latter point is important. Psychotherapy does more than stop symptoms; it brings about changes in the patient's attitude to his life situation, and enables him to come to terms with himself and with his life so that he can make important decisions, and, when faced with new problems, can deal with them instead of breaking down into illness. Some patients, instead of coming to me with fresh illnesses, now come and present an actual emotional conflict for discussion. Thus once rapport is established the patient no longer needs to present with masking symptoms but can openly come to his doctor with his emotional problems. If he still suffers from somatic symptoms, at least he has the insight needed to recognise their relation to his emotional state.

The use of psychotherapy in general practice may be limited where time is short; but with its help the doctor can unquestionably get nearer the ideal of treating patients and not merely their symptoms.

CHANGES IN THE NATIONAL DIET

AN astonishing amount of information on the diet of the United Kingdom, and of various groups within it, is given in the National Food Survey Committee's reports; and the one for 1954[1] carries analysis even further than before.

1954 was a year of transition from a controlled to a free economy. When it began, fresh meat, bacon, fats, and cheese were still rationed and subsidised; but by July nearly all direct controls had ended, and the only remaining consumer subsidies were those on bread, milk, and welfare foods. The level of the diet "was in practically all respects the highest yet recorded." The year, we are told, was one of prosperity.

> "In 1953 the pressure on the family budget relaxed; earnings rose more than prices, while the increase in food prices slowed down. Nevertheless, consumers devoted a slightly larger share of their increased real incomes to food, no doubt because of the improvement in supplies of several basic foodstuffs and the greater variety of other foods becoming available. In 1954 food expenditure again rose more than food prices. Comparing 1954 with 1950, the general price level had risen by a quarter, earnings by a third, food prices by two-fifths and household food expenditure by nearly a half." As a percentage of total expenditure on consumers' goods and services, expenditure on food has risen steadily from 29·8 in 1938 to 32·1 in 1954.

The energy value of "supplies moving into civilian consumption" increased to 3130 calories per head per day, compared with an estimated 3000 calories before the war. Consumption rose in all the main food groups except cereal products, potatoes, and other vegetables. The principal rises were for meat (12%) total fat content of oils and fats (7%) and sugar and syrup (8%). "The decline in cereals and potatoes, which are cheap sources of energy, has been continuous since 1949, and is associated with a rising standard of living." (Home supplies of fruit and vegetables were reduced in 1954 by the weather.) Compared with the pre-war diet, there was a smaller demand for fish and a much larger one for milk. The demand for liquid milk reached its peak in 1951, but in 1954 the total domestic consumption of liquid and processed milk was equivalent to nearly 5·1 pints per head per week.

In the average household, though the percentage of protein derived from animal sources rose between 1952 and 1954 from 48·6 to 53·9, the percentage of calories derived from protein fell from 12·6 to 11·7. On the other hand, the percentage of calories derived from fat rose from 34·5 to 36·5, and in households where the bread-winner earned more than £24 a week (class A1) nearly 40% of the calories were derived from fat and only 48% from carbohydrate. Supplies of edible oils and fats, which in 1952–53 were below the pre-war average, rose to a new high level in 1954.

Analysis according to the gross earnings of the head of the household shows that the values for protein, fat, iron, vitamin A, riboflavine, and vitamin C declined fairly steadily from class A (£15 and over) to the old-age pensioner: vitamin B_1 also showed a class gradient, not apparent in 1953. But, except for iron in the two lowest classes, all values were above the allowances recommended in 1950 by the British Medical Association's committee on nutrition.

The report shows, however, that the largest families barely maintained their level of real consumption. Taking consumption by younger childless couples as a base-line, and allowing for differences in energy requirements at different ages, families with several children consumed more than their proportionate share of potatoes, their approximate shares of milk and bread, almost their shares of sugar and preserves, but much less than their shares of all other main foods, especially meat, cheese, fish, fruit, and fresh green vegetables. Their consumption of all the main foods which are sources of protein and calcium "remained well below the level which a comparison with childless households would indicate as desirable." The difference between the standards of the diets of households with and without children has widened, though the widening is due to improvement in the nutritional position of the small family rather than to deterioration in that of larger ones.

In families with three children protein consumption was 92% of the B.M.A. recommendation; in families with four or more it was 87%; and in families with adolescents and children it was 86%. And the corresponding figures for calcium were 92%, 85%, and 91%. The committee gives graphs showing that these figures (all of which represented a decline from the previous year) would have been higher "if the intentions of the Flour Order, 1953, had been fully achieved." In other words, there would have been no decline if the millers had fulfilled their obligations under the order.[2]

The proportion of energy derived from fat, which rose in 1953, continued to rise in 1954 in households without children or with adolescents only, but was scarcely maintained in those with two or more children. The greatest dependence on carbohydrates as a source of energy was found, as in previous years, in households with four or more children or with children and adolescents. The proportion of protein derived from animal sources was highest in childless households and fell as the number of children increased.

1. Ministry of Agriculture, Fisheries, and Food. Domestic Food Consumption and Expenditure: 1954. Fifth annual report of the National Food Survey Committee (chairman: Mr. Norman C. Wright, D.SC.). H.M. Stationery Office. 1956. Pp. 89. 5s.

2. See *Lancet*, 1956, i, 895.

Conferences and Congresses

WORLD FEDERATION FOR MENTAL HEALTH

THE World Federation for Mental Health held its ninth annual meeting on Aug. 12–17 in West Berlin. The theme of the meeting was Mental Health in Home and School.

At the inaugural meeting the president, Dr. NILO MAKI (Finland), invested the new president, Dr. EDWARD KRAPF. Dr. Krapf has been appointed director of the mental section of the World Health Organisation, and he therefore resigned his office immediately after his address and installed as his successor Miss MARGARET MEAD, D.SC., the American anthropologist.

PSYCHOSOMATIC MEDICINE

In one of the technical sessions—that on advances in psychosomatic medicine—the opening speakers were Dr. FLANDERS DUNBAR (U.S.A.) and Prof. H. C. RÜMKE (Netherlands). Dr. Dunbar said there were no imaginary illnesses, only those of unknown cause. She thought "functional" illness was not such a good term as "psychosomatic" illness. Professor Rümke declared there was great danger in taking an extreme or mechanistic view: the spiritual factor in man needed to be kept constantly in mind. The concept of psychosomatic disorder might be dangerous if the doctor failed to make a physical examination or too easily accepted the psychic factor. This was especially true of endogenous depressions which needed electric-shock treatment and not only psychotherapy.

Dr. DENIS LEIGH did not believe that a doctor should try to play the rôle of clergyman or anthropologist or philosopher. He felt that the German literature introduced these aspects into medicine to an unreasonable extent. But Dr. DAVID STAFFORD-CLARK disagreed: the doctor, he thought, must take cognisance of moral values, though not enforcing his own on the patient, and the patient must come to terms with his own moral values. We needed to try and find a common language between the psycho-analysts, the psychosomatists, and general medicine.

MENTAL HEALTH AND PUBLIC AFFAIRS

Prof. IRWIN STRANSKY (Austria) said that he had long advocated the psychological investigation of the personalities and character structure of those who aimed at becoming leaders in politics, industry, or any other field which involved the handling of human beings. Only too often those who sought to lead others were motivated by a desire for power which derived from a sense of personal inferiority and inadequacy or were of paranoid tendencies which produced an attitude of aggressive hostility. These people were quite unfit to lead and should never be allowed to do so.

Dr. BROCK CHISHOLM (Canada) said that though this was theoretically desirable it was extremely difficult to put into practice. He felt that the most important thing was to understand the motivation of those who desired to be followers. The type of leader chosen would depend on the followers. Would-be leaders secured a following by appealing to anything which the group regarded as a shibboleth. Only people who had a wide enough knowledge and point of view to be world citizens were really fit to solve world affairs.

DIFFICULTIES IN BERLIN

Another session was devoted to problems of mental health special to Berlin. Dr. GERTRUD SOEKEN, a pædiatrician, spoke of the tensions which had been created by the division of the city and the effect they were having on children. There was a lack of concentration for learning among school-children, and the number of hypersensitive children was very high. She believed there might also be undetectable organic changes which would show themselves only in later years. It was their aim to examine and to treat medically every child who had difficulties at school or in the home. A school inspector, Mr. R. KELLER, said that millions of children had been brought up in unnatural circumstances; many had lost their fathers, and the mothers had to go out to work to support them. The children saw refugees arriving daily and the tragedy that this represented. There was a great need to improve the stability of the family and to try to minimise the threat from alcohol, tobacco, bad films, gambling machines, evil literature, and other harmful influences. He felt that the unity of Germany was a problem of mental health. The atmosphere of distrust and insecurity in the city had a bad effect on the children. Until recently they had been completely enclosed within an island and the children had no opportunity of going out to the countryside or to travel. The standard of honesty of the parents had declined so that the children were brought up without adequate moral values. The children of one part of the city had to learn Russian, the other French or English. There was a climate of fear and hostility. The result was in all ways to create conflicts. The problem was as great for those in the East as in the West of Berlin.

EUROPEAN LEAGUE FOR MENTAL HYGIENE

THE European League for Mental Hygiene held its sixth annual conference in Berlin on Aug. 11 and 12. Dr. DORIS ODLUM presided over the scientific meetings. The conference was concerned with mental health and modern forms of leisure activities, with special reference to the radio, television, the cinema, and activities involving speed.

Dr. DENIS LEIGH introduced the subject of television. Hardly a day passed, he said, without a pronouncement by some distinguished cleric, politician, author, doctor, or dentist on the effect of television on the manners, morals, and mental health of the community. These opinions were mostly unfavourable, but they were seldom based on any special knowledge and in many cases the critics admitted that they seldom watched television themselves. Dr. Leigh believed that the effects on the whole were favourable. Adults were chiefly concerned with the effects on children, but he believed that television had its largest impact on the adult. Most of the serious literature about it came from educationists but there was practically no psychiatric literature. This suggested that psychiatrists had no reason to think that it had startling effects one way or the other on patients or the community. It appeared that school learning had not been affected, that parental control over children's viewing habits did not appreciably affect their school achievements, and a careful B.B.C. study last year found that there was very little change in the leisure habits of viewers as compared with non-viewers.

Dr. THÉRÈSE LAMPERIÈRE (France) discussed the report of a working party on mental hygiene and the cinema in France. The conditions under which a film was viewed played an important part. Would a child react differently to the same film if he saw it alone or with his parents or with a group of other children? It was found that when spectators formed a homogeneous group, such as cine clubs for children or students or special audiences, spectator reaction was different from that of an ordinary heterogeneous audience. The cinema had a different effect according to age, sex, and intelligence, the degree

of education, and the character and the state of the emotions. Some scenes terrified young children such as the witch in *Snow White* and the burning forest in *Bambi*. Laws to prevent children seeing unsuitable films would be quite contrary to public opinion, and the best we could hope to do was to try to prevent the production of undesirable films.

Dr. Lamperière also read a paper on leisure activities involving speed. The desire for speed was an expression of man's dissatisfaction with his limitations and the frustrations of his personal life. The spectator derived at secondhand a similar satisfaction. In both cases the reaction was one of immaturity, a compensation for their feelings of inferiority and inadequacy as adults. For most people, driving a car undoubtedly liberated compensatory mechanisms against these feelings of inadequacy and this largely explained why people who were normally most tolerant and patient in their daily life became aggressive and rude when driving a car.

Medicine and the Law

A Murder Conviction Quashed

AN airman in the United States Forces, during an affray in a café, stabbed a man in the abdomen. The injured man was operated on within an hour and the wound stitched up. He died eight days later. The airman was charged with murder. The jury returned a verdict of guilty with a strong recommendation to mercy.

On an appeal against conviction, on the ground that the bronchopneumonia which caused the injured man's death did not result from the stab wound, counsel for the airman said that the case was of extreme importance from the medical point of view. It was not now disputed that it was the airman who stabbed the deceased. In view of information received after the trial, it was now submitted that the bronchopneumonia which was the cause of death did not arise as a result of the wound but was due to two other causes: first, the use of terramycin and, secondly, the quantity of fluid which was administered intravenously to the injured man two days before he died. Terramycin was prescribed at the time of the operation. However it was well known that a condition of diarrhœa might occur when a person was given terramycin. In the present case, although no infection in the sense of sepsis or peritonitis ever occurred, diarrhœa did develop and the terramycin was stopped; but two days later it was ordered to be continued, by another doctor. The diarrhœa continued and, because of subsequent dehydration, fluid was administered intravenously. The normal amount of fluid in such a case was 100 oz. a day, but 395 oz. was administered to the patient two days before, and 312 oz. the day before, he died. The evidence showed that that would cause bronchopneumonia in a normal person and, accordingly, it was submitted that that broke the chain of causation which would otherwise have made the airman guilty of murder. Counsel said that it was unnecessary for him to prove negligence; an error of judgment was sufficient for his purpose.

The court gave leave to call further evidence and heard Dr. Keith Simpson and Mr. Guy Blackburn.

Mr. Justice Hallett said that the court thought that, in the interests of justice, evidence ought to have been before the jury, although, in saying that, the court wished to make it clear that they were not casting any reflection on anyone. Had the evidence been before the jury it might well have resulted in their coming to the conclusion that the death of the injured man did not result from the stab wound.

Mr. Justice Hallett, giving the judgment of the court, said that this was an exceedingly unusual case. As a result of information received after the trial, the defence were able to put forward further evidence, including that of two doctors whose standing was unquestioned, Dr. Simpson and Mr. Blackburn. An application to call further evidence was granted only in the most exceptional circumstances.

The trial judge told the jury that the first question which they had to determine was whether they were satisfied that the airman caused the deceased's death by stabbing him in the stomach. On that question the jury had in substance the evidence of one doctor only, the pathologist who carried out the post-mortem, which was that the cause of death was bronchopneumonia following a penetrating abdominal injury. Looking at that evidence in the light of what the court now knew, "following" was ambiguous. It might mean chronologically, of which there was no doubt; but the trial judge interpreted it as meaning that bronchopneumonia supervened, all consequent on the stab wound inflicted. The further evidence showed that that was not so. In fact, Dr. Simpson and Mr. Blackburn were of the opinion that the death could not be said to have been caused by the wound.

It did not occur to anyone at the trial that there could be any doubt but that the answer to the question whether the stab wound caused death was in the affirmative. In those circumstances the court thought that this was a case where it could be said that the evidence was not truly available at the trial. The court felt that if the jury had heard two doctors, such as those who had given evidence, say that death was not caused by the stab wound they would have hesitated to take a contrary view.

It was most important to emphasise that there were two things other than the stab wound which were stated to have brought about death. The wound had injured the intestine, but that had mainly healed at the time of death. With a view to preventing infection, it was thought right to administer an antibiotic, terramycin. It was agreed that that was the proper course and the dose was a proper one. Unfortunately some people were intolerant of it, and the injured man was one of those. After he received the initial dose, he developed diarrhœa which was only properly attributable to terramycin. Very properly the terramycin was stopped, but it was continued again two days later. Dr. Simpson said that to introduce a poisonous substance, after the intolerance of the patient was shown, was "palpably wrong." Mr. Blackburn agreed that it was "palpably wrong" and that that description was justifiable.

The other step taken which was also regarded by those doctors as wrong was the intravenous introduction of a wholly abnormal quantity of liquid. It was introduced by three intravenous drips. Mr. Blackburn said that he had never seen three intravenous drips; he had occasionally seen two in profoundly shocked patients. The deceased subsequently developed pulmonary œdema and Mr. Blackburn said that he would not be surprised to see such a condition after the introduction of the amount of fluid given. Bronchopneumonia followed virtually automatically.

Whatever the law might be when death resulted from any normal treatment following a felonious injury, it was sufficient to say that in the present case there was not normal treatment. Not only was one feature wrong but two were, which produced the symptoms discovered at the post-mortem, which were the direct and immediate cause of death.

The court allowed the appeal and quashed the conviction.

Regina *v.* Jordan.—*Court of Criminal Appeal:* Hallett, Ormerod, and Donovan *JJ.* Aug. 21, 1956. Geoffrey Veale, Q.C., and R. R. Rawden-Smith (Payne & Payne, Hull); P. Stanley-Price, Q.C., and J. S. Snowden (Director of Public Prosecutions).

C. J. ELLIS
Barrister-at-Law.

In England Now

A Running Commentary by Peripatetic Correspondents

THESE do-it-yourself crusades in the feminine magazines are playing fast and loose with the established crafts of English life. Most of the spring was marked by blistering the paint off doors with a blow-lamp and making out the resultant claims for the fire-insurance people, then surging on knee-deep into synthetic paint and synthetic paste for synthetic wallpaper. The final reckoning was real enough. It would almost have been cheaper to have made pots of tea for the professional decorating gentlemen who used to favour us with periodical disorganisation in the days before time and materials had drifted into the realms of fantasy and expense accounts. The lounge carpet has been monopolised all summer for spreading out the paper patterns of summer frocks, unrolling yards of colourful plastic fabrics, and leaving pins to penetrate my slippers. Conversation has revolved round darts and gussets, hemlines and hemlock. Dressmakers must starve in their garrets even more realistically than they did of old.

My own attempts at self-help have brought only disillusionment. I still cannot make a decent mortise joint, the hairspring never never slips back into the watch, I always seem to pull the wrong buds off the chrysanthemums, the car pistons rattle like a can of peas after I've fiddled with the timing. Even some of my emulsions will not stay emulsified. That was why I called at the chemist's shop on my way home. He always has some cheerful scheme for trying out the latest samples on the unsuspecting, but that afternoon his face was unusually grave. He leaned across the counter and asked if my wife was feeling better. I said that as far as I could remember the old girl was last seen at lunch-time deep in ideas for brightening up the bathroom. A lot must have happened since then. About two o'clock our eldest daughter had bought half a pound of Epsom salts; nothing unusual if that is the way your fancy takes you. But at half past three our youngest offspring had come hurtling down the road on her bicycle, burst frantically into the shop, and demanded another four pounds of Epsom salts for her mummy who wanted it so urgently that she had forgotten to send any money. I made good the outstanding debt, and warned the chemist not to sell any dynamite to the family without a signed prescription.

The journey home was worryingly punctuated with halt signs and possible diagnoses. I ran up the steps into the house. No tea ready in the lounge, not a sign of life. Then strange noises floated down the stairs from the bathroom. I took them two at a time and banged nervously on the door. The next-of-kin in an indecently healthy voice pointed out that the door was not locked but she was too busy to open it, and suggested that I used the one outside. That was no time for false modesty, when the full wealth of my clinical skill might be put to good use at last. My jaw dropped. The better half was kneeling on the window-sill, slapping some opaque decoration on the lower panes of glass. "Here," she said brusquely, "come and help stir up some more Epsom salts before it sets!" With a sigh of relief I did it myself, as the magazine said.

* * *

This time next week the human flotsam of the town will be far behind us, the waiting-room door will be shut for a whole blessed fortnight; for we drive away to the sea on Friday afternoon. Not for us to sail with the tide in the morning, but to linger in peace on the fringe of the waves and wait for the treasures the waters will bring. The teenagers can shriek and splash and rescue each other out in the deeps, or sweep tempestuously off to the pin-tables and honky-tonk in the vulgar town around the headland. I shall dig my toes into the sand of the broad bay and renew the thrills of beachcombing. Some day there will really be a message in a bottle, some day a real diamond ring, just as some day the pattern of eight little circles will roll in the seventy-five thousand from more magical pools. But down on the beach the dividend comes drifting in with every tide.

Beachcombing is a solitary art, best practised without the distraction of envy at others' treasure trove, taken at one's chosen pace, spared the embarrassment of exposing inadequate acquaintance with post-mortem ornithology in an advanced state of decay. A solitary art because the wavering line of driftwood is not all that the shore can offer. The dance of sunshine on the water, the flick of spray, the curling of blown sand, the seeming infinity of sea and sky; and at one's feet the tangled chains of flotsam mixing natural treasure with man-made dross. Between the bottletops and orange peel lies an iridescent stone, the reproach of a dead tern's plumage clogged with fuel oil, the riddle of a woman's evening glove. Inspection, then palpation—the second-nature routine of diagnosis swings into action. Hopeful percussion for a fluid level in this wooden cask, and the ecstasy of auscultation of that empty shell. Only away from well-meaning sociable chatter can the full joy of beachcombing be found, the awareness of the place of these ephemeral treasures in the thin stratum of sedimentary rock in some geological tomorrow, the logical continuity of yesterday's seven thousand years.

The next seven days cannot fly too quickly.

* * *

We are holidaying together, a little group of us, and we make a very glamorous party. Dr. and Mrs. A have brought their Swiss girl, 21, blonde, with a dashing line in beach-wear. Dr. and Mrs. B have a dark and attractive Italian girl of 25, who makes the most of chic evening clothes. Then there is Dr. and Mrs. C's Danish girl, who has a remarkable selection of finely coloured aprons, and has had a new one every day so far. But the most striking of all is Dr. and Mrs. D's dark-eyed Spanish girl, who dresses with faultless taste on all occasions. Of course, it is very convenient to have baby-sitters on holiday if hard-working doctors want to take their wives out for the evening; but who wants to go out these wet summer evenings, especially when there is such a good opportunity to brush up one's languages?

* * *

Those recollections of the *Flying Scotsman* (July 28) remind me of a young man I once attended whose duties led him nightly from King's Cross to Peterborough; and never further. He never saw even the more pedestrian beauties of that run, yet he knew every inch of it—by sound, not sight. For he was the junior postman of the night sorting-coach of His Majesty's Mail. And his duties were to get ready the bags which were to be swung out on to the automatic receivers. His only guide was the subtle differences in sound and tone as the coach sped northward. It was a gruelling task. He was allowed to make only six errors per annum, and from Welwyn to Peterborough there were I forget how many mechanical jaws to collect and deliver mail. Alas the retrobulbar neuritis from which he was suffering soon disqualified him from his delicate work. Perhaps he found in this chronic illness to which he was condemned that the auditory senses which had been so trained still enabled him to enjoy a fuller range of awareness than most of us possess. How many of life's handicaps are attended with a widening capacity in other directions, and how few discover them?

* * *

Artefacts which deceive the eye of those who view radiographs are recognised hazards: indeed some are dignified by mention in the textbooks. But auditory artefacts seem to have had less attention. The description of Hippocratic succussion, for instance, does not usually include an admonition to remove the patient's hot-water bottle. In auscultation of a heart I was once completely deceived by a loud grating murmur—apparently from pericardial friction. A few moments later, however, the murmur was heard in the right ear, and not in the left. As I removed the stethoscope to find a reason for this, out struggled from the right earpiece the cause of the adventitious sounds—an earwig.

* * *

SUNTAN

Well begun
Is half done.
Done to a turn!

First-degree burn.

Letters to the Editor

DISMISSAL ON MEDICAL GROUNDS

SIR,—This item appeared in the *Times* of Aug. 22:

"Mr. Joseph McKibbin, aged 22, of Lewisham Road, Liverpool, who lost an eye in the Malayan jungle as a soldier, was discharged to-day from his work as a porter on Liverpool docks because he has a glass eye.

"Mr. McKibbin had an eye removed in hospital in Kuala Lumpur, after he had been shot in a terrorist ambush in the jungle. He finished his Army service in The Manchester Regiment, doing his full duties.

"In May, 1953, he applied for work on Liverpool docks, and six months later he was transferred from the temporary to the permanent register. Eight weeks ago he was medically examined and the doctor told him he had failed on account of his eye. Mr. McKibbin appealed to a tribunal, who upheld the doctor's decision, and his notice followed.

"Mr. McKibbin said to-day: 'My eye is no handicap at all. Other men with eye disabilities and even people with only one arm are still working on the permanent register.'

"An official of the Dock Labour Board said: 'Many men entered the docks two years ago without a medical examination. Now we are gradually examining them, and anyone who does not come up to the approved standard of fitness cannot be put on the permanent register'."

Fowler, in an article on the Pathology of Rehabilitation,[1] says:

"Of the unemployed cases, one of the most unfortunate was a young man who had had a good job as a bank clerk. He was found on routine examination to have mitral stenosis, and therefore lost his job. He had enjoyed his work and remained symptom-free until the diagnosis was made. Since that time he had developed an anxiety state about his heart condition which made his placing in suitable work very difficult."

Lambert[2] reports the following case:

"Recently an applicant for entry to the teaching profession . . . gave a history of pernicious anæmia, successfully treated . . . Her application for entry to two teachers' training colleges has been rejected on medical grounds, because of pernicious anæmia."

When someone has a condition making him a danger to others (such as epilepsy in a bus-driver or open pulmonary tuberculosis in a nursery-school teacher) there can be no dispute that he should be prevented from continuing in his job. But in other circumstances dismissal or rejection on medical grounds seems a grave interference with the liberty of the subject. Even if it can be argued that the dismissal or rejection is for the individual's own sake, because the "strain" of the work in question would damage him, this is no reason for compelling him not to do the work, though it may justify advising him to seek other employment. Moreover, convincing evidence to support this view can rarely be advanced. But in the three cases described the dismissal or rejection were in no-one's interests but the employer's. Do the medical men who coöperate in this process realise the implications of what they are doing? It seems that for them the Hippocratic Oath needs revising along the following lines:

"The regimen I adopt shall be for the benefit of the patients according to my ability and judgment, and not for their hurt or for any wrong, except when I am examining them on behalf of I.C.I., the Transport Commission, Barclays Bank, the Central Electricity Authority, and other similar bodies, in which circumstances the interests of these corporations shall always be placed before those of the individual."

As a profession we are very fond of attacking soulless bureaucracy, red tape, tyrannous officialdom, trumped-up jacks-in-office, &c., which are supposed to interfere in the doctor-patient relationship. May I suggest that we first put our own house in order and ensure that if medical examinations are performed in connection with work these are for the benefit of those examined, not for the benefit of the employing authority.

Farnham, Surrey. JOHN W. TODD.

1. Fowler, P. B. S. *Lancet*, 1955, i, 467.
2. Lambert, D. P. *Ibid*, 1953, i, 47.

THE FINAL EXAMINATION

SIR,—In your excellent Students' Number, every article of which I enjoyed, I suppose Professor Bull's was the most provocative.

I am not at all surprised at the low correlation between examiners in the written part of the examination, neither am I very disturbed by it, especially as we have recently given up this type of paper.

My first objection to the multiple-choice type of question in medicine is that diagnostic problems do not take that form. One is confronted by a difficult situation, and at some time in the course of the interview or investigation it suddenly occurs to one that this is a case of disseminated lupus, for instance. The patient does not come saying "Doctor I have one of seven possible conditions, will you kindly tell me which?" and hand the doctor a list of them. I have no experience of setting the multiple-choice type of question but I wonder if it is possible to set the equivalent of a question like the following: "Mention briefly the main causes of severe anæmia in an elderly patient."

However, my real concern is that the desire to devise a final examination which can be quickly and fairly marked will obscure altogether the far more important function of a final examination, so long neglected, which is to influence the education of the student. If he knows that he is to be confronted by multiple-choice questions he will spend his time learning multiple facts. We have just made the experiment for the first time of dividing our written work into two sections. The first consists of numerous questions on factual knowledge such as every student should be expected to possess: only very brief answers are required. The second paper gives the student three hours to write an essay on one subject only, chosen from six. If my students are not listening, I may say in confidence that I do not really mind very much how these essays are marked. I think we can pick out from amongst them the few which are clearly inadequate on any standard, and the few which are obviously brilliant. What I do hope is that our medical students in future will realise that after six years of university education we expect them to show the examiners, in reasonably literate terms, that they are capable of constructive thought on some aspect of medical knowledge. The subjects for the essay, though they all had a bearing on clinical medicine, were designed to give the student a chance to show that he could apply his physiological or pathological knowledge, or his interest in social or psychological medicine, to clinical problems, and thus to cut across the barriers of departmentalism in medical education.

The first round seems to have been a success and most of the students passed both parts of the written examination, as indeed they should. It remains to be seen whether its influence on the learning of medicine will be beneficial.

Department of Medicine,
The Royal Infirmary,
Manchester. ROBERT PLATT.

PROSTATECTOMY AT HOSPITAL B

SIR,—Although I found your leading article (Aug. 18) fascinating and stimulating, I was a little sorry for Hospital B. The brilliant statistics of Hospital A need to be interpreted with caution; prostatectomy is but one technique used in the management of prostatic obstruction in its various forms; some cases of moderate non-progressive obstruction in the elderly are properly treated conservatively; other cases, in which the expectation of life is only a few months because of cardiovascular or other disease, may be left with a permanent indwelling urethral catheter of the Foley type and small doses of a soluble sulphonamide. Again, that most dangerous type—the patient with chronic retention and clinical signs of uræmia—may succumb while on preliminary suprapubic drainage before he ever comes to pros-

tatectomy. Cases which in my experience do badly are those with senile mental changes; these are liable to have poor control after operation or incomplete bladder emptying; conversely, private patients, perhaps because of their higher average intelligence, do better.

With so many variables, therefore, every surgeon selects his cases and refuses, or offers alternative treatment to, others. Without full knowledge of the different types of case in a series and the selection employed, mortality-rates cannot be compared. The one variable which is always emphasised—the age of the patient—is not of major importance. A consecutive series of, for instance, partial gastrectomy for peptic ulcer is likely to be closely comparable with such a series from another hospital, given age similarity; but this does not hold with prostatectomy. I suspect that Hospital B may have a liaison with the local chronic-sick institution; or there may be a large waiting-list so that a high proportion of patients with an enlarged prostate come in with acute retention.

Nevertheless, if we had before us year by year the mortality-rates for prostatectomy in our own particular hospitals, I think it would be a great help and might lead to inquiry and improvement.

Leicester. PAUL HICKINBOTHAM.

SIR,—The papers by Mr. Skyrme Rees and Mr. Dawson-Edwards and your leading article all raise important issues.

Mr. Rees's operation is open to criticism on two counts. Firstly, a method which depends on a nylon suture passing through the sphincter and membranous urethra must involve some damage to those delicate structures from its tension, even if it is removed in forty-eight hours. Secondly, when the suture is removed the trigone will not have become fixed in such a short period and the pull of the detrusor muscle will partly return it to its previous position: it may well be left distorted by the procedure, leading to later obstruction at the bladder neck with residual urine and infection. I think a close urethroscopic follow-up is indicated in cases treated by this method, because strictures of the membranous urethra or bladder-neck obstruction are real possibilities.

There is no doubt, as Mr. Dawson-Edwards says, that a severe arterial secondary hæmorrhage must be controlled by direct attack on the bleeding point, by some urethroscopic instrument (it can be done with a cystoscope if the internal sphincter is well opened at operation); but cases sufficiently severe to require such treatment should be very few if a 30 ml. Foley catheter is used correctly and I have found it necessary to diathermy only 3 cases in the past ten years, with my prostatectomies averaging 80 to 100 per year.

The important point is the correct use of the Foley catheter, whether postoperatively or for the control of secondary hæmorrhage. Mr. Dawson-Edwards's admirable diagrams demonstrate clearly that the large arterial branches are all at the bladder neck; therefore adequate pressure on that structure will nearly always control hæmorrhage. To do this the balloon of the Foley catheter should *always* be in the bladder and *not* in the prostatic fossa and should be inflated to such a size that it cannot slip through the enlarged bladder neck into the fossa. In such position it will be partly pressed through the bladder neck by bladder contractions, if not inflated too much, and thus bring pressure where it is required. In cases where bleeding is free the pressure can be increased by attaching the catheter to the leg below the knee with an elastic band or the wrist of a rubber glove for twelve to twenty-four hours.

Catheters used in this way should have a third eye proximal to the balloon for drainage of the prostatic fossa.

The Foley balloon placed in the prostatic fossa is both dangerous and inefficient; dangerous because it prevents adequate drainage of the fossa, leading to sepsis, excessive sloughing, and so more risk of secondary hæmorrhage. (Incidentally, it increases the risk of epididymitis from blocking of the ejaculatory ducts). It is inefficient in that situation, because it has to be inflated to a size which may endanger the rectum before it compresses the vessels instead of pushing them upwards away from its pressure.

As your leading article states, we all see more secondary hæmorrhages since the advent of the antibiotics, but in my experience very few need a return to the theatre for diathermy. The factors which are responsible for this are:

(1) Adequate exposure of site of the main vessels at operation; Wells's internal sphincterotomy,[1] whether by the transvesical or the retropubic route, is excellent for the purpose as well as for opening the bladder neck.

(2) Control of blood-pressure during operation so that major vessels are not missed; and in this connection, spinal anæsthesia, with the risk of a fall in blood-pressure, has been outmoded since the relaxants came into use.

(3) No excessive use of the diathermy or sutures to control operative bleeding.

(4) Adequate drainage by correct positioning of the catheter and of the Foley balloon in particular.

(5) The use of a small catheter (16 or 18 F) to avoid urethritis.

(6) The use of such antibiotics as are in favour at the time!

Rochdale. A. M. MCMASTER.

INTESTINAL OBSTRUCTION DUE TO FOOD

SIR,—Mr. Rowling's article of Aug. 11 freshens interest in this condition, and like others who have written about it in the past he should reap a good harvest of correspondence. Besides the papers that he cites, there are others which are important—e.g., those of Elliott [2] and Latchmore [3] and a leading article in this journal.[4] As the number of recorded cases mounts, so the foods responsible show an ever-widening spectrum, from Christmas pudding (Keynes [5]) to meat (Vaughan-Payne [6]). But orange pith seems to be the commonest: to swallow an imperfectly peeled and chewed segment of orange is to court obstruction and even disaster.[7] The condition should be still better known, and cease to be regarded as a curio.

The 1914–18 war provided its own special variety of obstructive food in the form of "ammunition bread," and since the late war there has been an increase of cases from dehydrated foods, particularly peaches. More recently attempts to reduce body-weight have provided other examples due to methyl cellulose (Desjacques [8] and Francillon [9]) taken before meals in order to fill the stomach and so decrease the appetite. Cellulose as a soup-thickener, or even as a fæces-thickener, may lead to obstruction, though, in the latter respect, the makers of 'Celevac' claim that pure methyl cellulose does not form lumps in the same way as carboxymethylcellulose.

Of the three cases described below, two were proven and one was not. In that it occurred in a patient who had undergone gastrectomy, the first is similar to Mr. Rowling's.

CASE 1.—A man, aged 25, was admitted with abdominal pain and vomiting of 8 hours' duration: he vomited small quantities of green fluid about every half-hour. On questioning, he denied eating any extraordinary foods in the previous days. A Polya gastrectomy had been performed for a duodenal ulcer three years before, with a good result. In addition, he suffered from mitral stenosis and aortic incompetence.

There was visible persistalsis and a few bowel sounds, with tenderness and rigidity in the lower abdomen; and the tentative diagnosis was intestinal obstruction probably associated with the gastrectomy. At operation the last 9 in. of the ileum was found to be obstructed by an intraluminar, putty-like mass, and pieces of a white substance, thought to be coconut, could be seen through the wall. The impacted material was broken up and gently massaged into the cæcum

1. Wells, C. Prostatectomy. Edinburgh, 1952; p. 49.
2. Elliott, A. H. *Amer. J. med. Sci.* 1932, **184**, 85.
3. Latchmore, A. J. C. *Lancet*, 1940, i, 1153.
4. *Lancet*, 1940, i, 1170.
5. Keynes, G. *Brit. med. J.* 1950, i, 1266.
6. Vaughan-Payne, R. *Ibid*, p. 1435.
7. *British Medical Journal*, 1954, ii, 1301.
8. Desjacques, R. *Lyon chir.* 1952, **47**, 866.
9. Francillon, J. *Ibid*, p. 888.

without difficulty, and recovery was uneventful. The patient admitted to eating a large amount of coconut on the day before his illness.

CASE 2.—A man of 30 came into another hospital with a rapid onset of severe abdominal pain and vomiting. Examination revealed a mass in the right iliac fossa, and the preoperative diagnosis was appendix abscess. Operation showed a mass in the terminal ileum and cæcum, with complete obstruction. The appearances suggested an obstructing foreign body, and incision of the ileum revealed large amounts of coconut. This was evacuated and the bowel was repaired. While under anæsthesia the patient regurgitated further pieces of coconut. After the operation his condition rapidly deteriorated and aspiration bronchopneumonia was diagnosed. He was transferred to the thoracic unit at this hospital, where over twenty pieces of coconut were removed from the bronchial tree. The patient, who made a complete recovery, admitted to having eaten a whole coconut some hours before the onset of his abdominal pain and vomiting.

CASE 3.—A man, aged 41, suffered from colic and vomiting for three days. During this time he had nothing to eat and little to drink and his bowels were not opened. On being questioned about abnormal foodstuffs he said he had eaten about twenty partly cooked chestnuts at a party two evenings before the onset of symptoms. He looked well, the abdomen being slightly distended and tender; bowel sounds were present; and rectal examination was normal. A plain X-ray showed some fluid levels in the small intestine and gas in the colon. He was given fluids by mouth and an enema, which produced much flatus and fæces. Next day he was perfectly well, and a barium meal and follow-through a month later was normal.

It is difficult to arrive at the diagnosis of obstruction due to food. In case 1, the past history of gastrectomy made one suspect obstruction due to bands and adhesions. The patient's denial that he had eaten extraordinary food is reasonable; coconut is not extraordinary at Christmas time. In case 3 the chestnuts were remembered on questioning, but the diagnosis was uncertain, if not dangerous, in view of the fluid levels shown on plain X-ray: however, the response to treatment was immediate.

The finding of fluid levels associated with a disproportionately good condition and a positive history seems a respectable triad, but it cannot be trusted. In case 1 laparotomy revealed a degree of impaction of food which would not have passed on by itself. Delay, caused by a knowledge of the intake of coconut, might have been disastrous. Moreover, though in this case the bolus was broken up and pushed into the cæcum, this might not have been possible, as in case 2. Ward-McQuaid [10] points out that such massage can damage the ileum. Enterostomy, as in case 2, may be necessary; and some deem it to be always so.

Avoidance of laparotomy in case 3 makes the diagnosis unproven, in spite of diligent inspection of the fæces. That castor oil or other purgatives should not be used is surely right.[3 4] On the other hand, excessive conservative zeal with fluids and enemata in avoiding laparotomy and thereby not making a sure diagnosis has its dangers. Laparotomy has very often been shown to be the safest measure in patients who have severe abdominal pain lasting more than five to six hours.

ANTHONY J. H. RAINS
PAUL DAWSON-EDWARDS
VICTOR S. BROOKES.

Queen Elizabeth Hospital, Birmingham.

SIR,—It was with great interest that I read Mr. Thompson Rowling's article. It brought to my mind a patient, a man aged 63, who was admitted to a hospital in St. Helens in October, 1952, with obstruction of the lower small bowel due to an impacted mass of undigested orange.

The mass was removed and he made an uneventful recovery, and he was told in future to take orange-juice instead of oranges. (He had had an operation for peptic ulceration ten years previously, but as this was done as an emergency it was assumed that a perforation only was closed.) A year later he was sucking an orange at home when a friend of his who had not seen him for some time called in and, striking him on the back, said, "Hello Jack, it's a long time since I've seen you"; and with that he swallowed half the orange which was not chewed. The same day he arrived in hospital again with acute small-bowel obstruction, and at laparotomy was found to have half an orange impacted in his lower ileum, which appeared to be somewhat narrowed about two feet from the ileocæcal valve. The mass was removed and the bowel sutured, and his convalescence was uneventful. He has been warned for the second time to confine himself to orange-juice.

In retrospect the operation eleven years ago may have been a gastrectomy or a gastro-enterostomy, which allowed the large mass of orange to pass through unimpeded to impact in his lower ileum. I have never before thought of this as a complication of gastrectomy or gastro-enterostomy, but it appears now that it can be.

St. Helens Hospital, Lancs. SEAMUS O'DONNELL.

SIR,—Mr. Rowling has reported from our sister hospital two cases of intestinal obstruction by food, following partial gastrectomy. I have another such case to report.

A fitter, aged 60, was admitted to the Leicester General Hospital on the morning of Aug. 5 (Sunday). Four years previously he had had a partial gastrectomy performed elsewhere, and he was pleased with the result. (This was an emergency Polya gastrectomy with no valve, done for perforated stenosing duodenal ulcer.) His midday meal on Saturday, Aug. 4, consisted of egg, bacon, tomato, and beans; afterwards he ate an orange without peeling off its tough "inner skin." At 3 P.M. that day he suddenly developed intestinal colic, which grew worse up to the time of his admission to hospital. He began vomiting (black fluid and beans) at 2 A.M. on Sunday, and was still vomiting when admitted. His bowels had not opened for two days and he had passed no flatus since the pain began.

On examination he looked ill at ease, his tongue was dry, and his pulse-rate was 100. There was considerable tenderness and guarding in the upper abdomen (particularly to the left of his midline epigastric scar), but no distension. Exaggerated bowel sounds coincided with spasms of colic. There was a succussion splash. Rectal examination was negative. Band intestinal obstruction was diagnosed.

At laparotomy the same day the ileum was found distended above and collapsed below a bolus of food two inches by one inch impacted three feet from the ileocæcal junction. As a complication, the weight of the distended lower ileum had swung it around its mesentery in an anti-clockwise direction, the pivot of this rotation being a short band near the ileocæcal junction. (This was *not* the cause of the obstruction.) The bolus of food (which felt like orange and beans) was tapered by finger-pressure and milked into the cæcum, the bowel untwisted, the adhesion divided, and the abdomen closed.

Postoperatively the patient has made an uneventful recovery, his bowel motion is "easier than at any time since operation" (gastrectomy), and he is going home in a day or so with the wound healed—resolved in future to peel his oranges properly.

Leicester General Hospital. P. J. RYAN.

SIR,—This correspondence prompts me to write about a patient I recently admitted.

He was a man of early middle age sent in as an acute abdomen at 4 A.M. on a windy summer's morning. He was moderately shocked and as I arrived on the scene urgently called for a bedpan, and passed a liquid motion. This relieved his colicky pain. The previous afternoon he had been to a football match where he had eaten some peanuts and his pain had begun at about 6 P.M. Loud rumblings came from his abdomen which was tense and hyper-resonant well up under both costal margins. There was nothing abnormal rectally and while being examined he vomited semi-digested stomach contents and passed two more precipitate motions which contained clumps of clearly recognisable peanuts. His abdomen was now quite relaxed, and he excused himself

10. Ward-McQuaid, N. *Brit. med. J.* 1950, 1, 1106.

for being a fraud. The early dawning of the new day brought light to my problem and I was reasonably convinced that this had been an episode of acute intestinal obstruction in a man wearing dentures who had to swallow his peanuts unchewed. Later that day the patient was clinically recovered; cultures of the stool proved negative and he was subsequently discharged—a narrow escape from the surgeon's scalpel.

Ashford Hospital,
Ashford, Kent. PAUL H. MINC.

THE UNRECOGNISABLE TABLET

SIR,—May I commend to Mr. Hall, who writes (Aug. 18) on his difficulty in recognising tablets, the habit of writing *Nomen proprium* (shortened to *Nom. prop.* or even *N.P.*) on every prescription? (I described this practice in a letter a year or two ago.[1]) If he had done this, the identical white boxes with the similar small white tablets would have been clearly labelled phenobarbitone and ephedrine, with their strengths.

My partners and I have followed this practice for some years. If one is deputising for another there is no difficulty in identifying the tablets or medicine prescribed by the absent member. Patients frequently know the name of the tablets, and instead of asking for the "white tablets for my breathing," which may be digoxin, ephedrine, aminophylline, or phenobarbitone, they ask for the correct tablet.

Our difficulty is in trying to identify the numerous multicoloured pills, sedatives, anti-histamines, and iron tablets which new patients, or (I regret to say) those attending hospitals, produce in boxes or bottles with no names.

I must confess that patients sometimes defeat the object of *Nom. prop.* by decanting all their pills into an empty aspirin bottle "to keep better." Moreover, not all chemists heed the written request. Our local chemists know our habits, but patients going to the neighbouring town sometimes come back with unnamed tablets. The only protest I have had came from a chemist who had to write on a bottle label a long prescription which had been suggested by a consultant. On most occasions the short *National Formulary* title is sufficient.

We know that many doctors are opposed to letting patients know what is being prescribed; but we have found no disadvantages in this. On the rare occasions when the nature of the drug is best concealed, a proprietary preparation may be prescribed; but occasionally the *Nom. prop.* convention may have to be abandoned—for example, in the case of a dying patient for whom heroin is prescribed; that name is too well known. Apart from such occasions as this, what exactly are the objections?

Totton, Southampton. EOIN L. MCQUITTY.

SIR,—The answer to this problem is quite easy. Write *N.P.* (*Nomen proprium*) at the end of your prescription and the chemist writes the name of the tablet on the box.

This has several advantages: another doctor can identify your remedy; the patient can ask for the drug by name or show the box if he needs more; and you can remind yourself when you have forgotten the obscure drug you prescribed a year before. It is also helpful when you are called because the baby helped himself to a box of tablets he found in a seldom-used drawer ("they were white," says the mother, "and small"). It is also cheaper than prescribing an expensive proprietary in order to aid identification—and anyhow not all proprietary preparations can be distinguished by sight.

The only conceivable disadvantage is that the patient learns the name of the drug, and I cannot for the life of me see why he should not.

Wantage, Berks. IRVINE S. L. LOUDON.

1. *Lancet*, 1953, ii, 1211.

SIR,—May I, from a patient's point of view, support Mr. Hall's preference for distinctive preparations?

While in hospital after a prostatectomy operation I was given only twice a pink sleeping-tablet and every three hours daily a white tablet—against urinary infections.

Before leaving hospital I was instructed to continue with the latter, and a nurse brought me a supply of 100 tablets in a carton. Out of curiosity I opened the box and to my surprise found that the tablets it contained were pink. On inquiry I was told that an error had been made by the dispenser who, having supplied the sleeping-tablets before, thought that it was they that were required for me again.

My doctor said had I taken the pink tablets every three hours he would have been at a loss to diagnose the reason for my sleepy condition, quite apart from the more serious consequences which could have resulted.

I do not know whether I was in Hospital A or B (your editorial, p. 343)!

S. B.

USE OF AMIPHENAZOLE IN CHILDBIRTH

SIR,—I have read with appreciation the article by Dr. Holmes (Aug. 18) on the use of amiphenazole ('Daptazole,' DHA-245) in the treatment of neonatal asphyxia due to morphine. However, Dr. Holmes is under a misapprehension when he states that the administration of the drug to the mother shortly before delivery would reduce the analgesia. Unlike N-allylnormorphine, amiphenazole is only a partial morphine antagonist. It does not prevent or interfere with the analgesic property of morphine. This has been shown in both animal experiments and clinically.

We have continued our work on the treatment of intractable pain of terminal carcinoma with large doses of morphine and amiphenazole.[1] Our series now extends to 400 cases. There is no doubt at all that a deep and prolonged analgesia is obtained with morphine in the presence of amiphenazole.

We have also used amiphenazole and morphine postoperatively in a small group of 12 cases. I have received a private communication from Dr. Hügin that he has completed a similar series. In both instances complete analgesia was obtained in the presence of amiphenazole. The analgesia has been assessed from the patients' statements and from their willingness to cough when such action would normally have caused great distress. I have also seen a report of the beneficial effects of giving amiphenazole, just before delivery, to the morphinised mother.

I support very strongly Dr. Holmes's opening remark: "Because of its superior action in producing analgesia and mental tranquillity, morphine has been generally accepted as the drug of choice for the management of long and painful labour." Dr. Holmes's demonstration of the value of amiphenazole should further extend the use of morphine in childbirth. Amiphenazole has one great advantage over N-allyl-normorphine: it is completely harmless, even in large doses. Per se, it has no action apart from that of being, sometimes, a mild respiratory stimulant.

Department of Pharmacology,
University of Melbourne. F. H. SHAW.

SIR,—I read with interest the article (Aug. 18) by Mr. Holmes on administration of amiphenazole to newborn infants made apnœic by the morphine given to the mother. He suggests that amiphenazole would be better given to the mother immediately before delivery were it not that this would counteract the analgesic effect of the morphine.

It has been generally found in this department that, while amiphenazole excludes the respiratory depressant effect of morphine, it by no means decreases its analgesic

1. McKeogh, J., Shaw, F. H. *Brit. med. J.* 1956, i, 142.

effect. Indeed sometimes when the two are combined smaller doses of morphine can be given.

In cases of advanced cancer requiring very large doses of morphine for intractable pain, the absence of the narcotic effect is obvious. The combination is valuable in terminal states where the disease causes pain and the mind is still clear.

Radiotherapy Department,
Charing Cross Hospital,
London, W.C.2. D. O'CONNELL.

ENGLISH FOR DOCTORS

SIR,—Dr. Whitehead's helpful article (Aug. 25) does a service in pointing out the somewhat verbose style used by many of us. English is a hard language to write correctly. Each piece of writing must be to some extent an illustration of the personality of the writer.

His first list of synonyms, "short words for long," in a way lays bare many faults which we have all committed. Each one of his longer words in this list has a meaning which is not always adequately conveyed by its shorter counterpart in a given context. The use of these slightly longer words gives colour, interest, and sparkle to a passage. For instance, Dr. Whitehead quotes ten longer words equivalent in meaning to the word "say." These ten words all have their place in the composition of a readable article. If one followed his example in this respect a piece of writing would be dull and lacking in the finer sense of meaning shown by many longer but better chosen words.

London, N.W.11. D. S. NACHSHEN.

SIR,—Dr. Whitehead protests against the misuse of the word "biopsy." It may well be as he claims, that biopsies were originally performed by pathologists. Yet as Sir Ernest Gowers says in his *ABC of Plain Words*: "Words change their meaning, sometimes usefully, sometimes not. . . . But it is not reasonable to condemn the use of a word in a well-established sense merely because its etymological meaning is different."

The wider meaning of the word would seem to reflect the need, with widespread use of the method surgically, for a neat word to describe it. And so for better or worse it would appear that now biopsies *are* taken by surgeons.

Western Infirmary,
Glasgow, W.1. IAN A. MCGREGOR.

RENAL TUBULAR ACTIVITY

SIR,—In reporting their observations on the effects of calcium infusion, Dr. Nordin and Dr. Russell Fraser (June 2) refer to their previous paper[1] to explain the ratio "clearance of phosphates : clearance of creatinine" as an index of renal tubular activity with regard to phosphate. While prepared to ignore the doubtful accuracy of the creatinine clearance as a measure of glomerular-filtration rate, we feel that the implications of this index should be fully understood and its limitations appreciated.

The observations of Harrison and Harrison,[3] Barclay and Cooke,[3] and Longson et al.,[4] in agreement with unpublished observations from our own laboratory, indicate that a change in the glomerular-filtration rate will in its own right cause a directly proportional change in the absolute amount of phosphate reabsorbed per minute. A similar relation between glomerular-filtration rate and amount reabsorbed can be demonstrated for the chloride anion, on analysis of the figures of Hare et al.[5] for the dog. This being the case, before any change in tubular activity for phosphate can be ascribed to induced alteration of the internal environment (e.g., calcium infusion or parathyroid hormone injection) correction must be made for any simultaneous change in glomerular-filtration rate. A reliable index should reflect primary changes in tubular activity irrespective of those produced by alterations in glomerular-filtration rate.

The work of Longson et al.[4] and Anderson [6] indicates that changes in plasma-phosphate level do not affect the absolute amount of phosphate reabsorbed, so that no correction need be made for this value.

The index $\frac{Cp}{Ccr}$ fulfils the criterion mentioned, as can readily be seen from the equation

$$\frac{Cp}{Ccr} = 1 - \frac{Tp}{Pp \times Ccr}$$

where Tp = absolute amount reabsorbed in milligrammes per minute and Pp = plasma-phosphate concentration.

This equation can also be written

$$\frac{Cp}{Ccr} = 1 - \frac{\text{Threshold value}}{Pp}$$

when threshold value $= \frac{Tp}{G.F.R.}$

and from this equation it will be seen that if the plasma-phosphate concentration rises the ratio will also rise. If, after calcium infusion, there is no rise in the ratio with a rise in the plasma-phosphate level, it can be justifiably inferred that there has been a simultaneous rise in the threshold value, due probably to parathyroid suppression. However, we feel that the threshold value, given by referring the absolute amount of phosphate reabsorbed to a constant glomerular-filtration rate of 100 per minute, is a simpler, more direct, and less cumbersome index of renal tubular activity than the index Cp : Cr while losing no accuracy. This threshold value is given by the formula

$$\frac{\text{G.F.R.} \times \text{plasma level} - \text{amount excreted in urine}}{\text{G.F.R.}} \times 100.$$

and is expressed in milligrammes per minute per 100 ml. filtrate formed.

Endocrine Laboratories,
Department of Medicine,
University of Cape Town,
South Africa. E. DOWDLE
W. P. U. JACKSON
R. HOFFENBERG.

CHLORPROMAZINE AND AMENORRHŒA

SIR,—It has been reported that chlorpromazine may cause amenorrhœa in normally menstruating women.[7,8] This amenorrhœa was found to be of the "œstrone-deficiency, normal-F.S.H." type,[8] as in cases of psychogenic (hypothalamic) amenorrhœa.

In an attempt to influence the hypothalamus, we have administered chlorpromazine to 3 women with psychogenic amenorrhœa. This treatment was followed in all 3 cases by uterine bleeding two to four weeks after the start of treatment. The chlorpromazine was administered parenterally in doses of 200–300 mg. daily for ten to fourteen days. One of these three cases was as follows :

A woman, aged 33, consulted us on account of amenorrhœa of five years' duration. Menarche at 14 ; cycle regular with menstrual periods every twenty-eight days, lasting five days. She had married, but her relations with her husband were unhappy, and five years previously she had divorced him. On the day of her divorce she had her last menstrual period, and she had been amenorrhœic since. To induce menstruation she had been treated with massive doses of œstrogens and progesterone, without effect.

Physical examination revealed no abnormality. Blood chemistry and serology normal. Radiograph of sella turcica normal. Vaginal smears showed moderate œstrone deficiency. Urine : follicle-stimulating hormone (F.S.H.) less than 30 mouse-units per litre, 17-ketosteroids 13 and 14 mg. per twenty-four

1. Nordin, B. E. C., Fraser, R. *Clin. Sci.* 1954, **13**, 477.
2. Harrison, H. E., Harrison, H. C. *J. clin. Invest.* 1941, **20**, 47.
3. Barclay, J. A., Cooke, W. T. *Nature, Lond.* 1944, **154**, 85.
4. Longson, D., Mills, J. N., Thomas, S., Yates, P. A. *J. Physiol.* 1956, **131**, 555.
5. Hare, R. S., Hare, K., Phillips, D. M. *Amer. J. Physiol.* 1943, **140**, 335.
6. Anderson, J. *J. Physiol.* 1955, **130**, 268.
7. Marshall, W. K., Lieberman, D. M. *Lancet*, 1956, **1**, 162.
8. Polishuk, W. Z., Kulcsar, S. *J. clin. Endocrin.* 1956, **16**, 292.

hours. Dilatation and curettage: cervix normal; no endometrial tissue found. Several attempts to induce bleeding with œstrogen and with œstrogen and progesterone failed.

The patient was admitted to hospital and treated with parenteral chlorpromazine 200 mg. daily, in four divided doses, for ten days. A week after termination of treatment she had normal menstrual bleeding that lasted for three days. Vaginal smears taken a week after menstruation showed moderate œstrone activity (Rakoff's classification).

It would appear therefore that, although chlorpromazine given to normally menstruating women may cause amenorrhœa of the psychogenic type, it may also induce bleeding in cases of psychogenic amenorrhœa. This may possibly be explained by the ability of chlorpromazine to inhibit or alter the "functional state" of the hypothalamus. The effect of chlorpromazine will thus depend on the "functional state" of the hypothalamus when the drug is administered.

Lea Rubin Laboratory, Department of Psychiatry, Rambam Government Hospital, Haifa, Israel.

W. Z. POLISHUK
S. FLIGELMAN.

NATRIURETIC EFFECT OF PROCAINE

SIR,—In unanæsthetised dogs we have studied the urinary excretion of sodium after massive intravenous infusions of physiological saline. In some cases we added to saline solution, administered in amounts totalling 3% of the body-weight, 0·015 g. procaine per kg. body-weight, and found that with this addition sodium excretion was significantly increased.

Without the addition of procaine the mean sodium excretion was 373 μeq. per min., whereas in the procaine series this was as high as 800 μeq. per min. The difference is highly significant. There was no difference in the excretion of endogenous creatinine between the two series; hence it seems that only diminished tubular sodium reabsorption can account for the increase in sodium excretion.

Experiments are in progress to elucidate the mechanism of this effect. Procaine, like other agents acting directly on the central nervous system (including morphine and nicotine), inhibits water diuresis, and we believe that its natriuretic effect is due to a direct action on the central nervous system. This view is apparently supported by the fact that the animals given procaine showed the manifestations of central nervous excitation, including restlessness and salivation.

We have found no published report of the enhancement of sodium excretion by procaine. Pronina [1] has reported an increase of diuresis following administration of physiological saline containing procaine.

Physiological Institute, University of Budapest.

P. BÁLINT
A. C. HAJDU.

THE CASUALTY DEPARTMENT

SIR,—Until modern diagnostic and treatment services are made readily available to the injured, there is much to be said for reverting to Lucas-Championnière's principles in the treatment of chip fractures of the fingers, as Dr. Rose suggests (Aug. 11). Yet a significant proportion of fingers so treated will become stiff and painful.

Not infrequently the chip is avulsed by the interphalangeal collateral ligaments, and if it is grossly displaced and rotated there may be tears of the joint capsule, often extending into the common flexor sheath. When such displacements are allowed to persist, the subsequent excessive fibrosis permanently fixes the ligaments in their displaced positions and binds down the flexor tendons so that the finger becomes stiff and painful.

Such serious working disabilities can be avoided only by the very early open repair: once the finger has become stiff I know of no satisfactory treatment that will result in its full recovery. Similar closed "chip" fractures with gross displacement are seen in the ankle, elbow, knee, and hip joints.[1] Since in the average casualty department the patient is unlikely to find at his immediate disposal a theatre, an anæsthetist, and a surgeon familiar with the techniques of such early repairs, it seems logical to coördinate these departments with a fully comprehensive central accident hospital where these services could be guaranteed.

Dr. Rose also lays stress on better teaching of medical students and young graduates in the diagnosis and treatment of injuries. Teaching and regular discussion are of even greater importance to the coördination of any region's total accident services.

In Birmingham we have established a special organisation for teaching and discussion conferences between our staff, the industrial nursing and medical services, general practitioners, and undergraduates and postgraduates, and the results have shown, we believe, that this was worth while.

For example, every industrial accident must be immediately reported. Consequently, the numbers of trivial injuries seen and treated by the industrial medical services are enormous—at a conservative estimate 10 million a year. Fewer than 1% of industrial injuries are referred for hospital treatment; the remainder are dressed and treated and kept "on the job." Some years ago the hand infections alone were responsible for the major part of the cost of *all* industrial accidents. As a result of hospital research into the layout of dressing-stations essential to modern wound-dressing techniques [2] and the teaching by classes and a well-produced coloured talking film, infection of all minor open wounds has been greatly reduced.

Hospitals have not yet been given the opportunity (though we have sought it) to influence the practice of accident ambulance crews, who undertake, unaided, the first major operation on all severely injured people—i.e., their quick extraction from the debris of their accident and their speedy transport to hospital. Here is a field for the closest coördinated effort. Ambulance crews could give important—perhaps vital—information to the surgeon of the receiving hospital, and hospital experience could greatly improve their first-aid handling and transport of the severely injured.

The total research, treatment, and teaching responsibilities of a coördinated casualty and accident service are potentially considerable.

How long must we continue to wait for the Ministry of Health to produce a realistic and progressive hospital policy for the care of the injured?

Birmingham Accident Hospital.

WILLIAM GISSANE.

RESERPINE IN ACNE VULGARIS

SIR,—In the course of work on the treatment with reserpine of disturbed psychiatric patients [3] we were impressed by the striking improvement of acne vulgaris in 6 out of 7 of our younger patients. Genest [4] has already reported that reserpine favourably affects psoriasis.

Each of the 7 patients showed the typical picture of oily skin with comedones, papules, and pustules. During treatment with reserpine (in doses averaging from 1 to 20 mg. a day) the intensity of the eruption diminished considerably in all 7 patients, and in 6 the skin eventually became altogether free of the dermatological affection.

Cerebral dysfunction, resulting in endocrinological changes, plays an important part in the origin of the acne vulgaris.[5] Reserpine, which has also hormonal effects,[6] probably eliminates the endocrinological changes which lead to acne.

Talbie Psychiatric Hospital (affiliated to Medical School of Hebrew University and Hadassah), Jerusalem.

S. BRACHA
J. PH. HES
M. ERDREICH.

1. Pronina, N. N. *Bull. exp. Biol. Med., U.S.S.R.* 1955, **5**, 12.

1. Gissane, W. *Practitioner*, 1955, **175**, 450.
2. Gissane, W., Miles, A. A., Williams, R. E. O. *Brit. J. industr. Med.* 1944, **1**, 90.
3. Hes, J. Ph., Bracha, S. *J. ment. Sci.* (in the press); *Harefuah* (in the press).
4. Genest, J. *Brit. med. J.* 1955, ii, 381; *Canad. med. Ass. J.* 1955, **72**, 490.
5. Darier, J., Civatte, A., Tzanck, A. Précis de dermatologie. Paris, 1947; p. 540.
6. Barnard, R. D., Barnard, E. *Lancet*, 1956, i, 638.

HYPOTHYROIDISM AFTER THYROIDECTOMY

SIR,—May I enlarge on a point made by Dr. D. N. Baron in his valuable survey of hypothyroidism (Aug. 11)? Analysing the incidence of postoperative hypothyroidism, which he found to be 4% after subtotal thyroidectomies, he concluded that "there is no apparent difference in the incidence of hypothyroidism following thyroidectomy for toxic and for non-toxic disease of the thyroid gland." For the sake of brevity, he did not differentiate in his paper between various types of goitres; and, as the likelihood of developing postoperative myxœdema particularly depends on the type of goitre in non-toxic thyroid diseases, I have obtained from him some further information:

Of the 11 patients with hypothyroidism following operation for non-toxic conditions, 4 had lymphadenoid goitres, 4 had "simple" non-toxic nodular goitres, 2 had mitral stenosis for which hypothyroidism was induced, and 1 remained untraced. During the period under review 317 thyroidectomies were done in non-toxic cases, of which only 10 were found to have lymphadenoid goitre.

A survey was carried out recently of proved Hashimoto cases operated on at Middlesex Hospital in 1934–56. Of 35 cases in our records, it was possible to assess the thyroid status in 31; and all except 1 required full doses of thyroid. 19 were given gr. $1^1/_2$–$4^1/_2$ of thyroid extract soon after operation and have been maintained on full dosage continuously. 10 patients omitted thyroid (directly after operation or later) and developed profound myxœdema within four to six weeks; 1 patient died of myxœdema coma after a period of mental confusion when she refused treatment. Only 1 patient was euthyroid without substitution therapy two years after operation, and on examination it was found that she had a recurrence of the goitre. The 19 patients who had had continuous thyroid therapy since operation stated that they were unable to do without their tablets, for after three to five days they began to feel tired and unwell.

These figures show once more that, though postoperative myxœdema is relatively uncommon after removal of "simple" non-toxic nodular goitre, it occurs in well over 90% of patients with Hashimoto's goitre.

Institute of Clinical Research,
Middlesex Hospital Medical
School, 40, Hanson Street,
London, W.1. DEBORAH DONIACH.

VAGOTOMY FOR CHRONIC PEPTIC ULCER

SIR,—I was interested to read the report (Aug. 4) by Mr. Slaney and his colleagues, giving their five-year results of vagotomy without gastric drainage in the treatment of peptic ulceration. In this report they mention the problem of incomplete nerve section, and this must always be considered when this operation is used.

When vagotomy was introduced some ten years ago, the detailed anatomy of the vagus nerves in man at the diaphragm level was studied by several workers. It seems that the abdominal approach is more certain to allow of complete nerve section than the thoracic. The nerves were found as two trunks (one anterior and one posterior) in approximately 70% of bodies examined, as three trunks in 25%, and as four or more trunks in 4%.

I first used the operation of vagotomy and gastroenterostomy in a few cases in 1948. At that time there was much doubt about the value of the operation. I used it, therefore, no more until last year, and then only after a study had been made of the five-year results of a large series of cases of duodenal ulceration treated by vagal-nerve section with gastric drainage. This investigation, which was undertaken by Mr. John Lloyd Davies, and the results of which will soon be published, was made possible by the coöperation of many surgeons in this country and by the generous help of the Dan Mason Research Foundation of the West London Hospital Medical School.

In my early cases I failed to keep a record of the number of nerve-trunks found and proved by histological examination; but in this recent series of only 32 cases two nerve-trunks (one anterior and one posterior) were found in 75%, three trunks in 19%, and four in 6%. Certainly in any large series the number of nerve-trunks found must agree with the anatomical facts.

London, N.W.1. HAROLD BURGE.

FŒTAL STETHOSCOPES

SIR,—I am at a loss to understand why the fœtal-heart stethoscope should be so popular with obstetricians and midwives when the fœtal heart is heard much more easily with a standard binaural stethoscope: there is also less chance of one sustaining a "disc lesion" when using the general-purpose instrument!

Manygates Maternity Hospital,
Wakefield. A. BERRY.

THE BASE DEGREES BY WHICH WE RISE

SIR,—Even at this distance of time and space, may we be allowed to support the remarks of Dr. Woodliff, in his reply to Dr. "Davey," in your issue of April 14? We agree with him that more accuracy and less wit is probably desirable in the writings of one so imbued with the urge for true scientific pursuit of knowledge as Dr. Davey. Further, we maintain that the D.PATH. is a useful examination and the PH.D. not as frightening as Dr. Davey suggests. It may be desirable in a large department to have people with one or the other qualification.

We would like to point to a further development which is taking place here and which no doubt could be followed in England. In Melbourne on Aug. 31 the inaugural meeting of the College of Pathologists of Australia will take place—an event which we hope will be of some importance in the years to come. The college is supported by the majority of pathologists in Australia and is to be an autonomous body with its own board of censors and admission standards. It will supersede the Australian Association of Clinical Pathologists and provides for membership by private, hospital, and academic pathologists.

If Dr. Davey is in Melbourne in early September we shall be pleased to entertain him and attempt to persuade him that D.PATHS may be useful and D.PHILS not odd or frightening but unmistakably medical. Perhaps he may also be persuaded to found that R.PATH.S.

J. T. DUHIG
General Hospital, Brisbane. G. M. WINDRUM.

PRIMARY ALDOSTERONISM

SIR,—I read with great interest the article (Aug. 18) of Professor van Buchem and his co-workers on Conn's syndrome.

The fact that their case was found to be due to hyperplasia, and not to a neoplasm, of the adrenal cortex opens up speculation about the site of secretion of aldosterone. Histological examinations showed the glomerulosa and especially the fasciculata to be hyperplastic—a finding which, Professor van Buchem says, makes it probable that both zones are concerned in the production of aldosterone. I feel that such a statement is not quite justifiable when experience of hypersecreting fasciculata does not allow the hypothesis that aldosterone is secreted in abundance, while, on the other hand, the above case, on which such a hypothesis is based, seems to be complicated by other endocrine anomalies unrelated to aldosterone.

For example, there is a pronounced deficit in bone age: the stature is of childish contours; there is practically an absence of axillary, pubic, and facial hair; and, as far as it can be judged from the photograph, there may be some hypogonadism too. Most of these could be taken to indicate

some pituitary dysfunction. Besides, the glucose-tolerance test shows a "lag" curve, which could conceivably be attributed to glucocorticoid disturbance. Furthermore, there is a discrepancy between the laboratory findings and the clinical picture as suggested by the near-normal values of 17-ketosteroids in the absence of the hair growth that they are supposed to promote. Also the hyperplastic fasciculata caused no increase in the glucocorticoids or in androgens, which reminds one of the non-secreting and yet well-differentiated tumours of this zone.[1]

It seems to me, therefore, that this is probably a case where, apart from the aldosteronism, there is a general abnormality of the adrenal cortex. Non-specific "abnormalities" have been postulated by experienced endocrinologists, including Thorn,[2] and may be due to enzymic peculiarities.

It is well known that after hypophysectomy the glomerulosa, unlike the rest of the cortex, escapes atrophy, while electrolyte metabolism remains unaffected. This, I believe, is probably due to lack of differentiation of the glomerulosa—the zone which Bennett thought to be "pre-secretory." It is possible that, because of this lack of differentiation, the glomerulosa cells are insensitive to corticotrophin. Aldosterone, which is produced by this zone, is richer in oxygen [3] than any other corticoid, while the inner, more differentiated, zones produce steroids with progressively less oxygen.

Now, the hyperplastic fasciculate zone in Professor van Buchem's case could be: (1) sporadic regression in the fasciculata enabling it to include aldosterone in its secretion; or (2) a hyperplasia not followed by hyper-secretion, occurring in an abnormal cortex against a background of other endocrine anomalies. The latter is the more likely. In any event, this case affords no reliable indication of what happens in a normal adrenal gland.

I am sure that descriptions of true primary aldosteronism will help to determine the exact extent of the aldosterone-producing area in the adrenal cortex.

National Hospital for Nervous Diseases, London, W.C.1. G. M. JACOBIDES.

CALORIE INTAKE IN RELATION TO BODY-WEIGHT CHANGES

SIR,—With regard to the suggestion of Dr. Ball (Aug. 11) that the weight loss observed in our obese patients on high-fat diets may be due to "a condition of acidosis or ketosis," we would like to point out that ketonæmia and ketonuria were not seen to any marked degree, nor were blood-sugar and plasma-bicarbonate values markedly decreased in any of these subjects. These findings are in accord with the report of Lyon et al.[4] The subject of resistance to ketosis in the obese is discussed by Evans,[5] who concludes as follows: "acidosis is not a menace to the obese or a factor to be considered in planning treatment."

It would appear, therefore, that Dr. Ball's suggestion is an unlikely explanation of our results.

The difficulty in the dietary management of some obese patients is quite unrelated to the fat content of the diet, and was observed with all types of experimental reducing diet where there was any serious reduction of food intake.

Department of Medicine, The Middlesex Hospital, London, W.1. ALAN KEKWICK
G. L. S. PAWAN.

1. Kazlaris, E., M.D. thesis, Athens University, 1950.
2. Fox, H. M. *In* Ciba Foundation Colloquia on Endocrinology. London, 1954; vol. 8, p. 615.
3. Wettstein, A., Kahnt, F. W., Neher, R. *Helv. chim. acta*, 1954, **37**, 321.
4. Lyon, D. M., Dunlop, D. M. *Quart. J. Med.* 1932, **1**, 331. Lyon, D. M., Dunlop, D. M., Stewart, C. P. *Biochem. J.* 1932, **26**, 1107.
5. Evans, F. A. *In* Diseases of Metabolism. Edited by G. G. Duncan. 3rd ed., London, 1952; p. 635.

OBSERVER ERROR

SIR,—Although I am much in sympathy with the views expressed by Dr. Fletcher [1] and Professor Yerushalmy (July 28), I would point out that neither has produced a conclusive case against the validity of the unusually low (though still alarming) observer error reported by Dr. Eley and Dr. Paxon.[2]

Intuitively one is driven to believe that there can be nothing wrong about Eley and Paxon's analysis, since their experiment differs in no fundamental way from that of Yerushalmy. It was merely on a smaller scale, using only two, instead of ten, observers. It would be expected to be less precise, but still unbiased.

Both Fletcher and Yerushalmy point out that one consequence of using only two observers would be that some truly positive films might be missed by both, and so be omitted from the calculation of error. But, equally, some truly negative films must have been read as positive by both observers and so become included in the trial series. Such an event would be expected to increase the error revealed in the independent readings. Professor Yerushalmy's observers B_2 and C_1 agreed on only 23 of his 30 truly positive cases, but they must have agreed to be positive several more of the original films subsequently agreed to be negative. A fair comparison with Eley and Paxon's series would have included the results on these false positives found by B_2 and C_1.

When I first read Eley and Paxon's letter I was sure that some explanation could be found for the smaller observer error they reported. But, apart from the slip pointed out by Fletcher, it seemed, and still seems, to me that their conclusions could not be refuted on internal evidence only. On the other hand, the accumulated evidence (Yerushalmy's many studies, Cochrane and Garland's international trial [3]) is such that it would be most unwise to assume that "only" 1 positive in 10 is falsely reassured after mass miniature radiography, instead of 1 in 3 or 4. Eley and Paxon's series may have been unusual, or there may have been a loop-hole in the precautions they took to ensure strictly independent readings.

Whatever the facts, one conclusion remains clear: at least 10% and possibly 30% of persons with clinically significant tuberculosis are being missed even after they have been persuaded to attend for chest radiography, and multiple film-reading can reduce this dangerous gap.

Pneumoconiosis Research Unit, Llandough Hospital, Penarth, Glam. P. D. OLDHAM.

THE MORTALITY OF ANÆSTHESIA

SIR,—In your annotation of July 14 you say that inhalation of vomited gastric contents is a prominent cause of mortality in obstetrics. I am surprised that no-one has commented on this, and am venturing to do so myself, though I shall probably be told that I am out of date.

I was obstetric resident at Guy's and later held the post of hon. visiting obstetrician to Grey's Hospital, Pietermaritzburg, in the 1920s. And, without actually specialising in the accepted sense of the term, in either obstetrics or anæsthesia, both were subjects which I always found of particular interest. I have dealt with obstetric cases in hospitals, nursing-homes, private houses, native huts, and have even given an anæsthetic to a native woman on the veld, and delivered her of a transverse presentation singlehanded. But among all these varied cases I have never seen one obstetric case die as the result of the anæsthetic given, or from inhalation of vomited gastric contents.

All of them, of course, were given simple chloroform, where an anæsthetic was needed, and one can only assume that the elaborate and powerful paraphernalia of modern mechanised anæsthesia is responsible for the increased death-rate, which did not occur with simpler and more direct methods in skilled hands.

Natal. G. DUNDERDALE.

1. Fletcher, C. M. *Lancet*, 1956, i, 808.
2. Eley, A. J., Paxon, T. G. *Ibid*, p. 511.
3. Cochrane, A. L., Garland, L. H. *Ibid*, 1952, ii, 505.

Public Health

Infectious Illness and School

THE memorandum on Closure of Schools and Exclusion from School on Account of Infectious Illness has been reissued by the Ministries of Education and Health after an interval of sixteen years.[1] Since 1942 there have been many changes not only in the type and severity of communicable disease but also in opinion on the necessity or advisability of excluding contacts; and accordingly the text has been sweepingly revised.

The authors are at pains to point out that it would be "most regrettable" if the impression were created that the closure of schools and the exclusion of infected or suspect children were the "most effective measures for preventing the spread of communicable disease." Indeed the procedures usually recommended are of very limited value in preventing or checking the spread of infection. The suggestions in the memorandum obviously must be applied in a form suitable to local conditions; the best measures of control of communicable disease must be decided on the spot.

Teachers can play a very important part by promptly recognising children with signs or symptoms suggesting communicable disease. The memorandum gives a revised schedule of incubation and exclusion periods of the commoner infectious diseases, and remarks that "the rules governing exclusion of contacts should not be more rigid than that suggested in this memorandum." For a dozen or more years, some authorities have had far less rigid rules than those recommended, and have had no cause for regret. In certain communities it is hard to be sure that the exclusion of young children who are contacts of measles and whooping-cough is a wise policy. In the case of poliomyelitis, encephalitis, and meningococcal infection, the compilers of the memorandum seem to have had some difficulty in making up their mind. They appear to condemn automatic exclusion of all contacts for specified periods without regard for the particular situation. On the other hand there may be something to be said for selective exclusion—for instance, of "children from a particular street or neighbourhood, or the children in a particular class," or those who have returned to school.

Principal school medical officers have the task of giving clear directions to head teachers about the exclusion of children and the arrangements for this—including transport home, which is especially important in these days when both parents may be away when the child arrives. The memorandum suggests that head teachers should inform the principal school medical officer as soon as possible regarding absence from school of children with infectious illness, particularly when two or more children from one household are absent at the same time. The school health visitor could help in outbreaks by inquiries at the schools and in the homes of the pupils.

The memorandum declares that the attention of parents "should be drawn to the fact that an ulcerated throat or a 'spring rash' may, in fact, indicate respectively a mild attack of diphtheria or scarlet fever," and that "to send children to school so suffering or when convalescing from such conditions without having first obtained a medical opinion, may have serious consequences for other children."

Sanitary authorities nowadays have no power to require the closure of a school. This power rests with the local education authority, acting no doubt on the advice of the medical officer of health and principal school medical officer. Epidemiologists will agree that only exceptionally is it necessary to close a school in the interests of public health.

The memorandum includes advice on exclusion of members of staffs, and a section on infectious disease in residential schools. This emphasises that closure of a school is always a serious step and is very rarely necessary. The school authority should give parents the facts in full and tell them that they may withdraw their children if they wish. When a school is closed because of infectious disease the medical officers of health of areas in which the pupils live should be informed.

1. Memorandum on the Closure of Schools and Exclusion from School on Account of Infectious Illness. Issued jointly by the Ministry of Education and the Ministry of Health. H.M. Stationery Office. 1*s.* 3*d.*

Poliomyelitis

In the week ended Aug. 18 uncorrected notifications of poliomyelitis in England and Wales were as follows: paralytic 58 (58), non-paralytic 97 (75); total 155 (133). This is an increase of 22 compared with the previous week, the figures for which are in parentheses.

The National Smoke Abatement Society has produced a booklet describing and explaining the Clean Air Act, which was placed on the statute-book on July 4. It may be had from the society (Palace Chambers, Bridge Street, London, S.W.1) at 6*d.* (post free) or 4*s.* 6*d.* per dozen.

Obituary

EMANUEL MANNIE LOURIE

M.B. Lond., M.R.C.P., D.T.M. & H., D.P.H.

Dr. E. M. Lourie, chief of the Section of Biological Standardisation of the World Health Organisation, died in Geneva on Aug. 11, at the age of 52.

After qualifying from University College Hospital, London, in 1927, he held house-appointments, and in 1930 took the diploma of tropical medicine. He then spent a short time in Palestine working on leishmaniasis with Prof. Saul Adler, and later in the same year joined the staff of the School of Tropical Medicine in Liverpool. Appointed to a Rockefeller research fellowship of the Medical Research Council, he worked with Prof. W. H. Taliaferro in Chicago, and it was there that he began to study chemotherapy—the subject which was to dominate his activities. During his two years in the U.S.A. he concentrated on the drug treatment of avian malaria, and introduced a method which with modifications was later adopted for the screening of antimalarial drugs in this country and in America during the war. In 1934 he returned to the Liverpool school, as a Beit memorial research fellow, to continue his work with Prof. Warrington Yorke. Together they published papers which put Britain in the forefront of chemotherapeutic research. Beginning with the chemotherapy and immunology of the trypanosomal and leishmanial infections, their work soon extended to other protozoal and spirochætal diseases. From it emerged the entirely new diamidine series of drugs, which they showed to be singularly effective in the prophylaxis and the treatment of human trypanosomiasis and visceral leishmaniasis, and in the cure of the babesial infections of dogs, cattle, horses, and other animals. Still in Liverpool, on expiry of his Beit fellowship Lourie was for a time a member of the scientific staff of the Medical Research Council. On Warrington Yorke's death in 1943 he was appointed director of the department of chemotherapy in the school, and he retained this post until 1948 when he went for a time to the department of pharmacology in Oxford before taking up his post with W.H.O.

His many other achievements included the first demonstration of the efficacy of penicillin against certain spirochætal infections in animals, and he forecast its rôle in the treatment of syphilis; the accuracy of this forecast was rapidly substantiated by himself and by other workers when supplies of the drug became more plentiful. In the early years of the war, at the request of the Colonial Office, he was investigating an epidemic of sleeping-sickness in West Africa; there he initiated large

field trials of the diamidine drugs which firmly established them as powerful curative agents in the earlier stages of the disease, and confirmed his initial experimental observations. Drug resistance and the allied subject of drug interference were among his main interests, and he did much to advance knowledge of them. He demonstrated the development of resistance to proguanil in bird malaria, and produced a proguanil-resistant strain of benign tertian malaria in man. He was much in demand as a contributor to symposia on chemotherapy, and wrote the chapters on this subject in several books. For many years he contributed the reviews on the chemotherapy of sleeping-sickness to the *Tropical Diseases Bulletin*. In 1945 he was awarded the Chalmers memorial medal of the Royal Society of Tropical Medicine and Hygiene.

Of his personal qualities, a Liverpool colleague, A. R. D. A., writes :

> As a man Lourie was of a vigorous and athletic type ; he was a charming companion, a very good friend, and a most loyal colleague. Endowed with much ability, high ideals, and an immense capacity for work, he brought out the best in his assistants and associates. Unassuming and singularly free from vanity, he was ever helpful to his subordinates, many of whom largely owed their subsequent progress to his selfless generosity.

A friend in Geneva describes him as " the good type of clear-thinking British scholar " ; and A. E. T. adds :

> Dr. Lourie joined the staff of the World Health Organisation over four years ago. I will always remember the impression he made on me when I first met him, in 1951. What struck me at once were the kindness in his eyes, his sincerity and enthusiasm, his clear mind and keen intellect. Here in Geneva he had to tackle problems of a character until then unfamiliar to him. He made very careful and methodical studies of many difficult international questions and soon commanded our respect and confidence in his judgment. Above all, he gained our affection. He was a most charming companion, with a keen sense of humour and a great, understanding love for his fellow-men. He was never rash in his judgment but always tried to understand other opinions. He was a great friend whom we shall sadly miss.

Dr. Lourie is survived by his wife and a son.

DAVID SANDS BROUGH

M.C., M.B. Glasg., D.P.H.

David Sands Brough, who died on Aug. 7, the son of John Brough and Margaret Smith Sands, was born at Kinross, Scotland, in 1883, and received his scholastic education there and at Allan Glen's School, Glasgow. He graduated in medicine at the University of Glasgow in 1911. After a brief spell in general practice in North Woolwich, he decided to take up public health and was appointed assistant medical officer to Plaistow Fever Hospital, West Ham. In 1914 he took the D.P.H. and was appointed assistant school medical officer in East Ham. He joined the R.A.M.C. in 1915 and was a regimental medical officer during the Dardanelles campaign. After the evacuation of Gallipoli he was transferred to France, where, for his distinguished service with the 37th Division at Arras, he was mentioned in Sir Douglas Haig's dispatches and awarded the Military Cross with oak leaves. He became deaf about this time, and, returning home, was sent to Duddingston as medical officer to a camp for convalescent wounded soldiers likely to be capable of further service abroad.

After demobilisation in 1918 he returned to East Ham as deputy medical officer of health and senior assistant school medical officer, but increasing deafness caused him to make the crucial decision to leave the public-health service and take up a career in pathology. And so, in January, 1922, he went to Leeds as a voluntary assistant in the department of pathology and bacteriology. Here, Brough devoted himself enthusiastically to acquiring skill and knowledge in his new field of work, to such effect that in December, 1922, he was appointed assistant pathologist to the Norfolk and Norwich Hospital with the late Dr. Claridge, an office which he held with credit (and indeed distinction) until his retirement in September, 1942. Entering on these new activities, as he did, at the age of 40, Brough, probably wisely, decided to remain a routine practitioner of pathology. Of his work in Norwich it need only be said that it was carried out with the greatest care, and with technical skill of a very high order, and his services were warmly appreciated by his clinical colleagues, with whom he speedily became and remained persona grata. The standard of work which Brough required for his own satisfaction was very high. He was for 20 years a member of the Pathological Society of Great Britain and Ireland.

Brough's deafness increased with the passage of years, despite the use of a hearing-aid, and he finally retired, mainly for this reason, in 1942, going to live in Edinburgh, where he devoted himself most successfully to horticultural and golfing activities and to maintaining a lively correspondence with his many friends. He was a marvellous companion, and if possible an even more marvellous correspondent. When he took pen in hand he couldn't help throwing off the most amusing and witty letters, sometimes in verse, of which he was no mean exponent.

In 1916 he married Susan Erskine of Edinburgh—a happy partnership indeed.

M. J. S.

Dr. SCOT-SKIRVING

Dr. Charles Corfield writes :

> I met and worked with Robert Scot-Skirving at Millbank in 1918, and after all these years I still retain quite a vivid memory of his delightful personality. He had charge, as you say, of the census block on the opposite side of the road to Millbank Hospital, and as his anæsthetist on frequent occasions I should say that he was a clever and careful operator, giving to those present a running commentary the whole time.
>
> Millbank was well served at that period, with Freyer of prostate fame, Arbuthnot Lane, and E.C. Hughes also of Guy's, and for some time Donald Armour too, and Sir James Kingston Fowler on the medical side. With this galaxy of talent occasionally meeting in the tea-room Scot-Skirving was the life and soul of the party.
>
> I shall long remember this gay figure with his greying hair, and the quick step which seemed to spell perennial energy.

Appointments

BADENOCH, JOHN, D.M. Oxfd, M.R.C.P. : part-time consultant physician, Nuffield department of clinical medicine, The Radcliffe Infirmary, Oxford.

BAMFORD, F. N., M.B. Manc., D.C.H. : asst. M.O., health department, City of Bradford.

CRICHTON, W. H., C.I.E., M.B. Edin., D.P.H. : whole-time asst. county M.O. and district M.O.H., Norfolk County Council.

COOK, C. A. G., M.C., G.M., F.R.C.S., D.O.M.S. : part-time consultant, Moorfields, Westminster and Central Eye Hospital, London.

EVANS, E. M. L., M.B. Wales, F.R.C.S., D.O. : part-time consultant ophthalmic surgeon, Aylesbury and High Wycombe area.

HUDSON, J. R., M.B. Lond., F.R.C.S., D.O.M.S. : part-time consultant, Moorfields, Westminster and Central Eye Hospital, London.

JEPSON, ANNE M., M.B. Lond., D.C.H. : M.O., public-health department, London County Council.

NEWTON, K. A., M.B. Lond., M.R.C.P., F.F.R., D.M.R., D.M.R.T. : asst. radiotherapist, Westminster Hospital, London.

SMAIL, MARJORIE, M.R.C.S., D.C.H. : asst. M.O. (maternity and child welfare and school medical inspections), Northamptonshire.

WILSON, I. C., M.B. Edin., D.P.H., D.P.M. : asst. psychiatrist, Menston Hospital, near Leeds.

WYBAR, K. C., B.SC., M.D. Glasg., F.R.C.S., D.O.M.S. : part-time consultant, Moorfields, Westminster and Central Eye Hospital, London.

East Anglian Regional Hospital Board :

GUPTA, A. S., M.B. Lucknow, F.R.C.S.E. : surgical registrar, Great Yarmouth and Gorleston Hospital.

LAMBDEN, PAMELA, L.R.C.P. : medical registrar, United Norwich Hospital.

NARIMAN, S., M.B. Bombay : registrar in chest diseases, Ipswich hospital group.

RAE, G. C., M.B. Aberd., D.P.M. : asst. psychiatrist, St. Andrew's Hospital, Norwich.

Notes and News

APPROVED NAMES FOR DRUGS

THE British Pharmacopœia Commission has issued the following new supplementary list of approved names:

Approved names	*Other names*
Acinitrazole	2-Acetamido-5-nitrothiazole. Trichorad.
Buclizine	1-(4-*tert.*-Butylbenzyl)-4-(4-chloro-α-phenylbenzyl)-piperazine. Longifene is the hydrochloride; Vibazine is the hydrochloride.
Carbutamide	*N*-Butyl-*N'*-sulphanilylurea. Nadisan; Invenol; BZ.55.
Chlorambucil	γ-*p*-Di-(2-chloroethyl)aminophenylbutyric acid. Leukeran.
Cyclizine	1-Methyl-4-α-phenylbenzylpiperazine. Marzine is the hydrochloride.
Cyclocoumarol	5':6'-Dihydro-6'-methoxy-6'-methyl-4'-phenylpyrano-(3':2'-3:4)coumarin. Cumopyran.
Forminitrazole	2-Formamido-5-nitrothiazole.
Hyoscine Methobromide ..	(-)-Hyoscine methobromide. Scopolamine methobromide. Methscopolamine bromide. Pamine.
Methoxyphenamine ..	1-o-Methoxyphenyl-2-methylaminopropane. Orthoxine.
Pipradrol	Diphenyl-(2-piperidyl)methanol. Meratran is the hydrochloride.
Sodium Diatrizoate ..	Sodium 3:5-diacetamido-2:4:6-tri-iodobenzoate. Hypaque.
Spiramycin	An antibiotic produced by *Streptomyces ambofaciens*. Rovamycin.
Sulphan Blue	Sodium salt of 4:4'-di(diethylamino)-4":6"-disulpho-triphenylmethanol anhydride. Blue VRS; Disulphine Blue VNS.
Tolbutamide	*N*-Butyl-*N'*-toluene-*p*-sulphonylurea. Orinase; D.860.
Zoxazolamine	2-Amino-5-chlorobenzoxazole. Flexin.

WARNING ABOUT TRANQUILLISERS

THE U.S. Food and Drug Administration has advised drug manufacturers and doctors to reduce the dosage of tranquillising drugs. According to British United Press, Dr. Ralph Smith, chief of the Administration's bureau of medicine, said the current tranquillising drugs may, if used to excess, have an adverse effect on the mental state of patients and cause peptic ulcers or ulcerative colitis. The warning was contained in a letter from Dr. Smith to drug manufacturers urging them to change their literature and labels, and reduce the dosage they recommend. The letter referred specifically to reserpine. When reserpine was introduced "the available evidence suggested that it was a drug of very low toxicity, with no contra-indications and with a wide range of safe dosage. . . . As the drug has been used more extensively it became apparent that reserpine is not the innocuous substance it was first thought to be, that there are contra-indications, and that the safe level for long-term outpatient maintenance is lower than the originally recommended dosage schedule."

ADVICE FOR THE HÆMOPHILIAC

THE Ministry of Health, with the coöperation of the Medical Research Council's Hæmophilia Committee, has produced a booklet [1] containing notes and advice for patients with hæmophilia and their parents, with the object of helping these patients to lead as normal a life as possible. Copies have been supplied to the clinics and laboratories which are acting as reference centres under the hæmophilia scheme initiated by the M.R.C. in 1954. General practitioners wishing to obtain copies for patients should apply to the nearest such centre [2] or to the public relations division of the Ministry, Savile Row, London, W.1.

THOMAS GUY

WE are already greatly indebted to Dr. H. C. Cameron for his history of *Mr. Guy's Hospital*. At the time it was written little was known of the ancestry of the founder, but a document has now come to light [3] which has enabled the family tree to be taken back three generations in considerable detail to a Thomas Guy, of Heckfield in the county of South'ton, who died in 1621. It is interesting to note that Guy's great-grandfather seems to have possessed the same desire as his descendant to succour those in misfortune, for the document in question records a meeting in May, 1687, of members of the Guy family to discharge a trust instituted by old Thomas to provide that every year, on the Feast of St. Michael the Archangel, £5 of lawful English money should be paid to some member of the Guy family to relieve poverty, to give help in sickness, to apprentice a boy, or "such like deeds of charity."

1. Hæmophilia: Some Useful Notes and Advice. Issued gratis by the Ministry of Health. Pp. 11.
2. See *Lancet*, 1954, ii, 1123.
3. Cameron, H. C. *Guy's Hosp. Rep.* 1956, **105**, 151.

THE EXPECTANT MOTHER

Mrs. Reid—a mother of four who has international experience of prenatal, intranatal, and postnatal care—gives information and advice to expectant mothers in a well-balanced, sane, and factual book [1] in which there is little to criticise and much to commend. Her advice on clothing and equipment is particularly good, and her wholehearted advocacy of breast-feeding is welcome. Here and there she does not make it clear that the average need not necessarily occur. The discomforts she allots to the seventh month, for example, are certainly not universal, and she seems unduly impressed by extrinsic and supposedly avoidable causes of miscarriages and premature births. Whether the comic-style line-drawing illustrations help the text is perhaps a matter of taste.

1. Ten Lunar Months. By JANE CABOT REID. London: Heinemann Medical Books. 1956. Pp. 180. 12*s.* 6*d.*

G!

FROM A CORRESPONDENT

IN Texas, U.S.A., you can be taken up to 20,000 ft. in a Lockheed T.33A aircraft, and from that height propelled towards the Earth with very great speed, either along a parabolic curve or in a straight dive. As reported in *The Lancet* of Aug. 18, Dr. Gerathewohl told the International Physiological Congress that this will have the peculiar effect of making you weightless. This effect is, of course, only temporary, but it will last at least 15 seconds during the dive and for twice as long on the parabolic descent.

Moreover, as Dr. Gerathewohl will explain to you after you have recovered from the lapse of consciousness which will probably accompany this experience, this does not mean that your mass will at any time have altered but only your weight. Your weight, he will point out, is the product of two factors—your mass and *g*, the acceleration which the gravitational force of the Earth is at all normal times striving to impart to it. Now we all know what would happen if, during a tug-of-war, we were to cut the rope in the middle: all the members of both teams would fall flat on their backs and the rope would at once become free from any pull whatsoever. This, if the aviation physiologists are to be believed, is exactly what happens when you dive fast enough towards the Earth: when you approach the Earth with an acceleration which is as great as that which the Earth's pull itself can produce, the Earth's invisible rope, as it were, goes slack; the Earth no longer pulls you at all and therefore you cease to have any weight; you achieve a state of sub-gravity or of zero-gravity as it is now called.

Needless to say, this technically marvellous procedure of rushing up towards the stratosphere and then rushing down again as fast as you can is not just for fun: it is carried out to find the best kind of *g*-suit that aviators of the future may require. In time to come, well-tailored *g*-suits will be an essential part of the travel outfit of every up-to-date business man. It has long been known that, if you want to go deep enough under the water, a pressure-resisting capsule in the form of a diving-suit is a necessity: in future if you want to come home really fast from the interstellar regions you will have to have a pressure-supplying garment which will give you the comfortable sensation that you weigh something after all, when in fact you weigh nothing.

Some people, we are told, have more "tolerance to positive acceleration" than others. This is a physiological and not a political statement: it concerns simply the person's "reflex adjustment to gravitational stress," and it is hoped that these experiments will help to "select individuals who are particularly suited for weightlessness."

Fortunately, to assist in this selection a less elaborate method has been discovered of making you weightless—i.e., by the human centrifuge. In this you can be comfortably accommodated in a cage fixed to a platform at the end of a rotating radial arm. When this machine is spun, whether you achieve a positive *g* or no *g* at all depends only upon which way up you are. This is no novel device; Dr. Gauer told the

congress that over a hundred years ago a human centrifuge which raised you to 4*g* was used in Berlin to treat mental disorders. However, even with the more speedy results which this will give, we may fall woefully behind more experimentally adventurous nations if we are going to depend upon mere chance for finding enough young men capable of being both weightless and conscious at the same time.

Hence one learns with peculiar satisfaction that Sir Bryan Matthews at Cambridge has been breeding families of rats in a centrifuge under much increased *g*. Of course, the father and mother rat can do nothing but move ponderously about, impeded by their greatly increased weight; but with their progeny things are quite different. Since pregnancy, parturition, suckling, and adolescence are all conducted under these strangely altered circumstances, the young are found to have a muscular and nervous equipment which is quite phenomenal. Hence in the near future we may reasonably hope that, although for civilian flying we may still have to fall back upon *g*-suits, for recruitment into our flying services we shall be able to breed an accredited brand of *g*-less-tolerant aviators.

Queen's University, Belfast

On July 10 the following degrees were conferred:

M.D.—Claire E. Morris (with commendation); P. C. McCrea.

M.B., B.Ch., B.A.O.—G. W. Johnston, S. D. Roberts (with second-class honours); Akinpelu Oludele Adesola, Maureen C. Archer, A. H. Armstrong, D. St. C. Baird, C. H. Balmer, H. J. Black, D. A. Blair, B. R. Bramwell, J. D. Brown, G. P. Burns, Honor J. M. Campbell, P. C. N. Clarke, J. W. Clarke, P. B. Crilly, Anne M. Duff, Anne Duffield, Turlough Farnan, W. R. Forbes, D. L. Freedman, W. D. M. Gaston, E. J. Gault, Daniel Gilmartin, C. K. Gorman, A. D. Gough, B. K. Gray, J. K. Houston, James Hunter, Olajide Adeyemi Idowu, F. K. Jabir, C. B. Kidd, J. G. Kinley, W. D. Kinley, D. J. H. Longford, Anne C. Lowe, R. B. Lowry, C. A. J. Macafee, C. P. McAree, D. J. McClure, May G. McGaughey, E. M. McIlrath, Donald McKay, D. G. Mayne, J. L. Milligan, C. N. S. Moorehead, I. B. Moran, R. S. Neill, S. D. Nelson, W. H. Newnham, J. C. Park, C. W. D. Phillips, O. H. Proctor, Gillian Prosser-Ashby, J. J. Robb, C. H. Stewart, Jack Strahan, I. H. Taylor, J. B. Walsh, Jacob Willis, John Wilson.

D.P.H.—Margaret M. Bell, J. A. Byrne, S. N. Donaldson, Peter Froggatt, Elizabeth Hawkins, Margaret King, P. J. Ward.

Society of Apothecaries of London

Dr. Macdonald Critchley has been elected master, with Dr. Reginald Fisher and Dr. W. S. C. Copeman as wardens.

The following diplomas have been granted:

L.M.S.S.A.—A. E. Purkis, W. J. Wren, C. S. Barton, W. S. Cole, F. K. Amarquaye, E. T. E. Richards, R. I. Muir, R. M. Breeze, H. C. Davies, D. C. Jones, J. A. Cooper, R. S. L. Turner, J. de B. J. Dade, R. O. S. Sims, J. A. M. Vasey, M. C. Shannon.

D.I.H.—S. K. Biswas, A. J. de Villiers, P. S. Edgecombe, D. I. C. Finlayson, J. R. Glover, A. S. Sethi, M. Zeville.

Liverymen are summoned to meet at Guildhall on Sept. 28, at 10.30 A.M., to elect a lord mayor of the city.

St. Mary's Hospital Medical School, London

Dr. Horace S. Baldwin (Cornell) will lecture at the Wright-Fleming Institute of Microbiology, St Mary's Hospital, London, W.2, on Monday, Sept. 3, at 5 P.M. Dr. Baldwin is to speak on Experimental Work on Bacterial (Staphylococcal) Allergy.

B.M.A. Scholarships

The British Medical Association offers the following research scholarships:

Ernest Hart (£300), Walter Dixon (£300), and four others (each of £200), for research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease; and Insole (£250), for research into the causes and cure of venereal disease.

Each scholarship is tenable for a year from Oct. 1, 1957, and may be renewed not more than twice. Applications should reach the secretary of the association, B.M.A. House, Tavistock Square, London, W.C.1, by March 1, 1957.

Nurses and Midwives Conference

The Professional Nurses and Midwives Conference and Exhibition, organised each year by the *Nursing Mirror*, will be held from Oct. 15 to 19 at Seymour Hall, London, W.1. The conference will be opened at 11 A.M. on the first day by the Dowager Marchioness of Reading, and afterwards Sir Ernest Rock Carling will give the Blackham lecture, on nursing and the radiation syndrome. The exhibition and conference are open only to doctors, nurses, and midwives, who can get free tickets from the organiser of the exhibition, Dorset House, Stamford Street, London, S.E.1.

Institute of Psychiatry, London

Miss Margaret Mead, D.SC., will give a lecture at the institute, Maudsley Hospital, S.E.5, at noon on Friday, Sept. 14. She is to speak on the Contribution of Social Anthropology to Psychiatry.

Conference on Medical Records

An educational conference, arranged by the N.E. and S.E. Metropolitan regional organisations of the Association of Medical Records Officers, is to be held from Oct. 2 to 7 in Brighton. The speakers will include Dr. Alexander Hall, Mr. J. E. Pater (under-secretary, Ministry of Health), Brigadier H. L. Glyn Hughes, and Dr. J. Knowelden. Further details may be had from the conference secretary, Miss C. Lawson, S.R.N., group medical records officer, Chase Farm Hospital, Enfield, Middlesex.

Nutrition Society

The Scottish group of the Nutrition Society is holding a symposium in Dundee on Saturday, Sept. 29, on Nutrition in Pregnancy. Both human and animal nutrition will be considered. Those interested should write for further information to Dr. J. Davidson, the Rowett Institute, Bucksburn, Aberdeenshire.

Synthesis of Gramicidin S

It is announced in Basle that the synthesis of gramicidin S, an antibiotic isolated in 1942 in Russia, has been achieved in the Ciba Research Laboratories. Previously it had been impossible to synthesise such highly complicated peptide rings, but recent work by R. Schwyzer and P. Sieber was successful.

Mackenzie Industrial Health Lecture

Dr. R. S. F. Schilling will give this lecture at the British Medical Association House, Tavistock Square, London, W.C.1, on Tuesday, Sept. 25, at 3 P.M. He is to speak on Assessing the Health of the Industrial Worker.

Nutrition of Laboratory Animals

A symposium on this subject is to be held jointly by the Nutrition Society and the Laboratory Animals Bureau on Saturday, Oct. 6, starting at 10.40 A.M., at Guy's Hospital Medical School, London, S.E.1. The meeting will be open without further invitation to medical, scientific, and veterinary graduates, and senior animal technicians.

Service for Doctors

A St. Luke's-tide Service for doctors is to be held at All Souls Church, Langham Place, on Sunday, Oct. 14, at 11 A.M., Mr. A. Dickson Wright, the retiring president of the Medical Society of London, and Dr. Thomas Hunt, the newly elected president, will read the Lessons. Seats will be reserved for doctors and members of their family who apply for tickets to the Secretary, All Souls Church House, Langham Place, London, W.1, by Thursday, Oct. 11.

Association of Anæsthetists of Great Britain and Ireland

The annual meeting of this association is to be held in London at the Royal College of Surgeons on Nov. 1 and 2. Further particulars may be had from the secretary of the association, 45, Lincoln's Inn Fields, W.C.2.

CORRIGENDUM: *Treatment of Nephrotic Syndrome.*—In this article by Prof. M. L. Rosenheim and Dr. A. G. Spencer (Aug. 18, p. 313) the manufacturer of the polystyrene sulphonate resin, 'Katonium,' was wrongly named. This resin is manufactured by Bayer Products Ltd.

Statistics for the hospital and specialist services in 1953 have now been issued by the Ministry of Health (Hospital and Specialist Services, England and Wales: Statistics for the Year ended Dec. 31, 1953. H.M. Stationery Office. Pp. 309. 27*s.* 6*d.*).

Dr. L. Guttmann has been invited by the Nuffield Foundation to visit Australia early in 1957 to advise on the setting up of spinal centres and the vocational training of the disabled.

Births, Marriages, and Deaths

BIRTHS

LAWRIE—On Aug. 20, at Nuffield House, Guy's Hospital, to Jean (née Grant), wife of Rex Lawrie, M.S.—a son (James)

CRUICKSHANK.—On Aug. 17, at King's College Hospital, London, to Ann (née Burch), wife of Professor Eric K. Cruickshank, University College of the West Indies, Jamaica—a daughter (Catherine Elizabeth).

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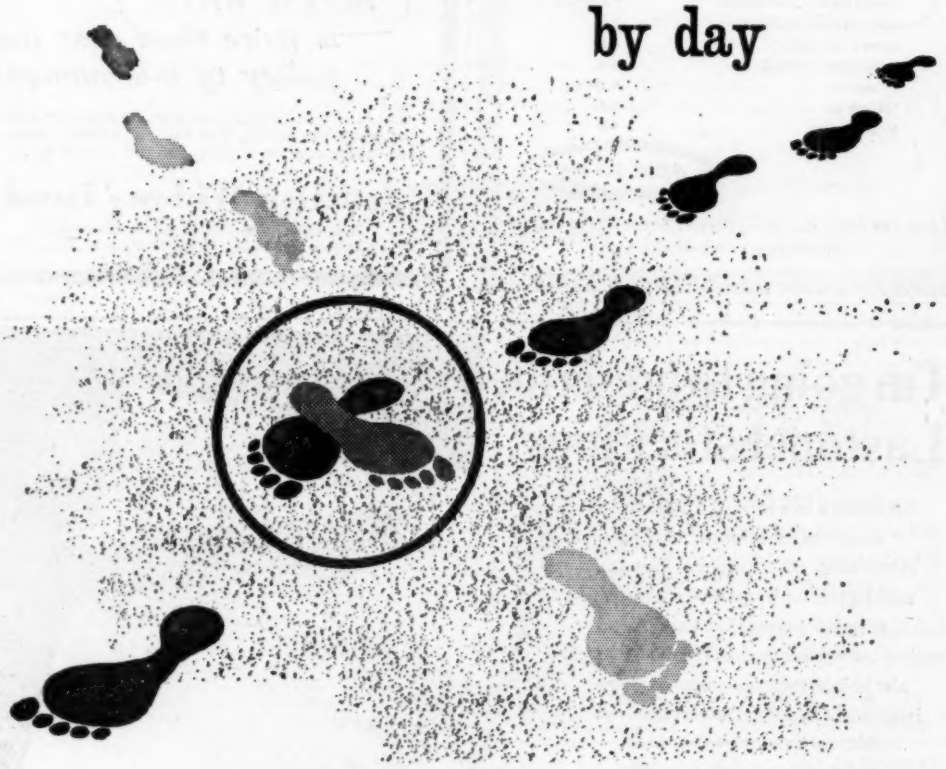

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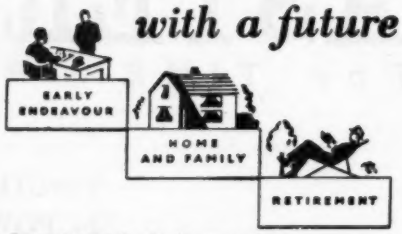

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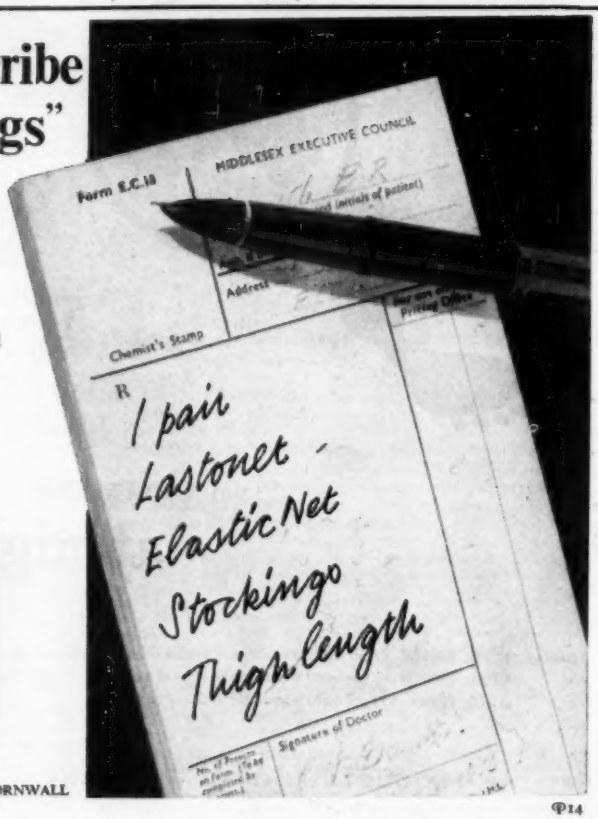

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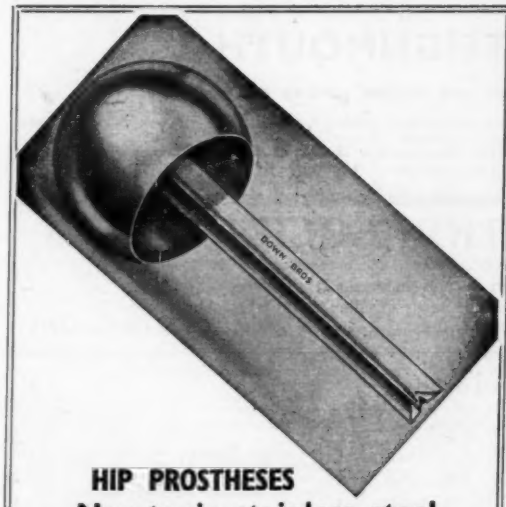

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This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Piombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultraviolet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

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Vacancies

ACADEMIC AND EDUCATIONAL SECTION — Page 44

ANÆSTHETICS

Hackney, E.9. Sr. H.O. 47
St. Charles', W.10. Reg. 47
St. Olave's, S.E.16. Sr. H.O. 48
Woolwich Group H.M.C. Sr. H.O.'s .. 48
Birmingham. Dudley Road. Sr. H.O. 48
Birmingham. Selly Oak. Sr. H.O. .. 48
Birmingham United Hosps. Reg. .. 48
Broxburn, W. Lothian. Bangour Gen. Sr. H.O. 49
Chertsey. St. Peter's. Reg. 49
Chesterfield Royal. Reg. 49
Colchester. Essex County. Sr. H.O. .. 49
Derby. Derbyshire Royal Infy. Reg. 50
Doncaster Royal Infy. Sr. H.O. .. 50
East Anglian R.H.B. Reg. 50
Farnborough, Kent. Sr. H.O. .. 50
Harefield, Middx. Reg. 50
Leeds R.H.B. Reg. & Locum Regs. 51
Liverpool R.H.B. P.-t. Cons. 45
Manchester R.H.B. Sr. H.M.O. .. 45
Manchester R.H.B. Reg. 52
Newcastle R.H.B. Reg. 52
Northampton Gen. H.O. 52
North East Met. R.H.B. Reg. .. 47
Oxford R.H.B. Sr. H.M.O. 45
South Cheshire H.M.C. Sr. H.O. .. 54
South East Met. R.H.B. P.-t. Cons. .. 45
Stafford H.M.C. Sr. H.O. 54
St. Albans City. Locum Reg. 54
Stockton-on-Tees. Sedgefield Gen. Sr. H.O. 53
Winchester. Royal Hants County. H.O. 55
Worcester. Ronkswood. Sr. H.O. .. 55
B.W.I. University College Hosp. H.O. 55

CASUALTY

Connaught, E.17. Sr. H.O. 46
Hampstead Gen., N.W.3. Sr. H.O. .. 47
Edgware Gen. Locum Sr. H.O. .. 50
Epsom Dist. Sr. H.O. 50
Hastings. Royal East Sussex. Sr. H.O. 51
Hillingdon, Middx. Jr. H.M.O. .. 50
Huddersfield Royal Infy. Jr. H.M.O. or Sr. H.O. 50
Ipswich & East Suffolk. Locum Sr. H.O. 51
Liverpool. Bootle. Jr. H.M.O. .. 51
Northampton Gen. H.O. & Sr. H.O. .. 52
Nottingham Gen. Sr. H.O. 53
Slough. Upton. Locum H.O. 54
Southport Gen. Infy. Jr. H.M.O. .. 54
Sutton & Cheam. Sr. H.O. 54
Weston-super-Mare Gen. Locum Sr. H.O. 55
B.W.I. University College Hosp. Sr. H.O.'s & H.O.'s 55

CHEST AND TUBERCULOSIS

Archway Group H.M.C. Reg. 46
Brompton, S.W.3. H.O.'s 46
Highlands Gen., N.21. Sr. H.O. .. 47

London Chest (Country Branch). Sr. Reg. 47
Birmingham (Sanatoria) Group H.M.C. Jr. H.M.O. 48
Holt, Norfolk. Kelling Hosp. & Dept. of Thoracic Surgery. Locum Jr. H.M.O. 50
Leeds R.H.B. Sr. Reg. 51
Leicester Isolation Hosp. & Chest Unit. Reg. 51
Leicester. Markfield. Reg. or Sr. H.O. 51
Maidstone. Preston Hall. Sr. H.O. .. 52
North East Met. R.H.B. Regs. .. 47
Reading & Dist. H.M.C. Jr. H.M.O. 53
Skipton. Grassington. Jr. H.M.O. .. 54
South East Northumberland H.M.C. Jr. H.M.O. or Sr. H.O. 54
Welsh R.H.B. Reg. 55
Wigan & Leigh H.M.C. Reg. 55
Woodford Green. Harts. Sr. H.O. .. 55

DENTAL SURGERY
Royal Free Hosp. Group. Reg. .. 47

DERMATOLOGY
North West Met. R.H.B. P.-t. Cons. 44
Whittington, N.19. P.-t. Clin. Asst. (G.P.) 48
Newcastle United Hosps. Reg. .. 52
North East Met. R.H.B. P.-t. Cons. 45
Oxford United Hosps & R.H.B. P.-t. Cons. 45

EAR, NOSE, AND THROAT
Birmingham United Hosps. Sr. Reg. 48
Brighton & Lewes H.M.C. Sr. H.O. .. 49
Guildford. Royal Surrey County. Sr. H.O. 50
Hull A Group H.M.C. Sr. H.O. .. 50
Northampton Gen. Sr. H.O. 52
Oxford R.H.B. P.-t. Cons. 45
Scotland. Western R.H.B. Reg. .. 53
Southampton. Royal South Hants & Gen. Sr. H.O. 54
South East Met. R.H.B. P.-t. Cons. .. 46

INFECTIOUS DISEASES
Plymouth. Scott Isolation. Sr. H.O. 53

MEDICINE
Bethnal Green, E.2. H.O. 46
Elizabeth Garrett Anderson, N.W.1. H.O. 46
Hammersmith Hosp. & P.G. Med. School, W.12. H.O.'s 47
Hampstead Gen., N.W.3. Pre-reg. H.O. 47
Mile End, E.1. H.O. 47
Princess Beatrice, S.W.5. H.O. .. 47
Royal Masonic, W.6. Reg. 47
St. Charles', W.10. Reg. 47
St. James', S.W.12. H.O. 47
St. Nicholas, S.E.18. H.O. 47
Aberdeen. Special Hosps. B.O.M. H.O. 48
Altrincham Gen. Sr. H.O. 48
Bedford Gen. Sr. H.O. 48
Beverley. Westwood. H.O. or Sr. H.O. 48
Bolton & Dist. H.M.C. Sr. H.O.'s .. 49
Cambridge. Addenbrooke's. Sr. Reg. 49
Chelmsford. St. John's. H.O. .. 49
Croydon. Mayday. Locum Reg. .. 50
Epping. St. Margaret's. H.O. .. 50
Huntingdon County. H.O. 50
Ilford. King George. Pre-reg. H.O. .. 51
Isleworth. West Middlesex. Reg. .. 51
Leeds R.H.B. Locum Regs. 51
Leeds United Hosps. Sr. Reg. .. 51
Leicester Gen. Reg. 51
Romford. Victoria. H.O. 53
Salford Royal. Sr. H.O. 54
Scunthorpe. War Mem. Sr. H.O.'s or Pre-reg. H.O.'s 53
Taplow. Canadian Red Cross Mem. H.O. 55
West Bromwich & Dist. Gen. Pre-reg. H.O. 55
Weymouth & Dist. Pre-reg. H.O. .. 55
Worcester. Royal Infy. H.O. .. 55
B.W.I. University College Hosp. H.O.'s 55
Mullingar (Ireland) County. R.M.O.. 55

NEUROLOGY
Haywards Heath. Hurstwood Park. Sr. H.O. 50

NEUROSURGERY
Bristol. Cossham/Frenchay H.M.C. Sr. H.O. 49
Sheffield United Hosps. Reg. 54

OBSTETRICS AND GYNÆCOLOGY
Elizabeth Garrett Anderson, N.W.1. H.O. 46
Hammersmith Hosp. & Inst. of Obst. & Gyn. & North West Met. R.H.B. Reg. 46
Aberdeen Special Hosps. B.O.M. H.O. 48
Birmingham R.H.B. Reg. 48
Bury & Rossendale H.M.C. Sr. H.O. 49
Derby City. Pre-reg. H.O. or Sr. H.O. 50
Edgware Gen. H.O.'s. 50
Guildford. St. Luke's. Reg. 50
Hastings. Buchanan. H.O. 51
Hemel Hempstead. West Herts & St. Paul's Hosps. Reg. 50
Manchester R.H.B. Regs. .. 51/52
Manchester United Hosps. H.O. .. 52
Newcastle Gen. H.O. 52
Newcastle R.H.B. Reg. 52
North East Met. R.H.B. Reg. .. 47
Reading Combined Hosps. H.O. .. 53
Sunderland Royal Infy. H.O. .. 54

OPHTHALMOLOGY
Moorfields, Westminster & Central Eye. Reg. 47
Leeds R.H.B. Reg. 51
Maidstone. Kent County Ophthalmic & Aural. Sr. H.O. 52
Manchester R.H.B. Sr. H.M.O. .. 45
North West Met. R.H.B. P.-t. Cons. 44
Sheffield R.H.B. Sr. H.M.O. 45
Stoke-on-Trent. North Staffs Royal Infy. Sr. H.O. 54

ORTHOPÆDICS
Archway Group H.M.C. Locum Reg. 46
Central Middx., N.W.10. Sr. Reg. .. 46
Alton. Lord Mayor Treloar Orth. Sr. Regs. 48
Birmingham R.H.B. Reg. 48
Birmingham. Royal Orthopædic. Sr. H.O. 49
Bournemouth. Royal Victoria. Sr. H.O. 49
Braintree. Black Notley. Locum Reg. 49
Isleworth. West Middlesex. Pre-reg. H.O. 51
Leeds R.H.B. Reg. & Locum Regs. 51
Louth County Infy. Reg. 51
Manchester R.H.B. Reg. 52
Newmarket Gen. Sr. H.O. 53
Northampton Gen. H.O. 52
Southampton. Royal South Hants. H.O. 54
South East Met. R.H.B. Sr. H.M.O. .. 46
South East Met. R.H.B. Reg. .. 54
Southend Gen. Sr. H.O. 54
Southend-on-Sea. Temp. Reg. .. 54
Southport. Promenade. Sr. H.O. .. 54

PÆDIATRICS
Hosp. for Sick Child., W.C.1. Sr. H.O. 48
Canterbury. Kent & Canterbury. H.O. 49
Luton & Dunstable. H.O. 51
Newcastle R.H.B. Reg. 52
Northampton Gen. H.O. 52
Oxford R.H.B. Reg. 53
Reading. Royal Berks. H.O. 53
Southampton Child's. H.O. 54
South West Met. R.H.B. Locum P.-t. Cons. or Sr. H.M.O. 46
Welsh R.H.B. Cons. 46
West Bromwich & Dist. Hosp. Group. Jr. H.M.O. 55
York County, City & Yearsley Bridge Hosps. Locum Sr. H.O. 55

PATHOLOGY
North East Met. R.H.B. Reg. .. 47
Ashford, Middx. Sr. H.O. 48
Leicester Royal Infy. Sr. H.O.'s .. 51
Northampton Gen. Sr. H.O. 52
North East Met. R.H.B. Sr. H.M.O. 45
Oxford. United Hosps. Reg. 53
Sheffield R.H.B. Cons. 45
Sheffield United Hosps. Sr. H.O. .. 54

PHYSICAL MEDICINE
South East Met. R.H.B. P.-t. Cons. .. 45

PLASTIC SURGERY
Chepstow. St. Lawrence. Sr. H.O. .. 49
Newcastle R.H.B. Reg. 52

PSYCHIATRY
St. Clement's, E.3. Sr. H.O. 48
Bedford. Bromham. Reg. 48
Bury. Fairfield Gen. Jr. H.M.O. .. 49
Carlisle. Garlands. Sr. H.O. 49
Carstairs, Lanarks. State Instn. & Mental Hosp. Phys. Supt. (Cons.) 44
Coulsdon. Cane Hill. Reg. 50
Coulsdon. Netherne. Sr. H.O. .. 50
Coulsdon. Netherne. Locum Reg. .. 49
Gloucester. Barnwood House. Deputy. Med. Sup. 45
Ilford. King George. P.-t. Clin. Asst. 51
Leeds R.H.B. Sr. Regs. & Locum Regs. 51
Lichfield. St. Matthew's. Jr. H.M.O. 51
Newcastle Gen. H.O. 52
Newcastle R.H.B. Sr. H.M.O. .. 45
Newcastle R.H.B. Reg. 52
Newcastle United Hosps. Reg. .. 52
Scotland. Eastern R.H.B. Sr. Reg. .. 53
Scotland. North-Eastern R.H.B. Phys. Supt. & Cons. 45
Scotland. Northern R.H.B. Sr. H.M.O. 45
Scotland. Western R.H.B. Regs. .. 53
Sheffield R.H.B. Sr. Reg. 53
St. Albans. Cell Barnes. Reg. .. 54
Virginia Water. Holloway San. Reg. 55
Wallingford, Berks. Fair Mile. Jr. H.M.O. 55
Wickford, Essex. Runwell. Sr. H.O. 55
Virginia, U.S.A. Physicians 46

RADIOLOGY
Hosps. for Diseases of the Chest. P.-t. Cons. 44
Colchester. Essex County. Locum Cons. or Sr. H.M.O. 45
Western Australia. Royal Perth. Sr. Radiologist & Radiologist 46

RADIOTHERAPY
Cambridge. Addenbrooke's. Sr. Reg. 49
Sheffield R.H.B. Sr. Reg. 53

RHEUMATOLOGY
Sheffield. United Hosps. & R.H.B. Reg. 54
Taplow. Canadian Red Cross Mem. H.O. 55

SURGERY
Battersea Gen., S.W.11. H.O. .. 46
Brompton, S.W.3. Sr. H.O.'s or Regs. 46
Hampstead Gen., N.W.3. Pre-reg. H.O. 47
Lambeth, S.E.11. Reg. 47
Manor House, N.W.11. R.S.O. .. 47
North East Met. R.H.B. Regs. .. 47
South London Hosp. for Women & Child, S.W.4. Reg. 47
Alton Gen. Sr. H.O. 48
Alton. Henry Gauvain. Locum Reg. 48
Ashford, Middx. H.O. 48
Bedford Gen. Reg. & Locum Reg. .. 48
Bexhill, Sussex. H.O. 48
Birmingham Accident. H.O.'s .. 49
Birmingham United Hosps. Locum Reg. 48
Canterbury. Kent & Canterbury. H.O. 49
Cardiff. Royal Hamadryad Gen. & Seamens. Sr. H.O. or Locum .. 49
Carshalton. St. Helier. Pre-reg. H.O. 49
Crewe & Dist. Mem. Sr. H.O. .. 49
East Anglian R.H.B. Regs. 50
Edinburgh. Princess Margaret Rose. H.O. 50
Hull. Victoria Hosp. for Sick Child. H.O. 51
Leeds R.H.B. Regs. & Locum Regs. 51
Leicester Royal Infy. H.O.'s 51
Manchester. Altrincham Gen. Pre-reg. H.O. 52
Manchester R.H.B. Regs. 52
Manchester. Wythenshawe. Regs. .. 52
Margate. Gen. Sr. H.O. 52
Musselburgh, Midlothian. Edenhall. Sr. H.O. 52
Northampton Gen. H.O. 52
Nottingham. Highbury. Sr. H.O. .. 53
Portsmouth Group H.M.C. Sr. H.O.'s 53
Reading. Battle Hosp. H.O. 53
Redhill. East Surrey. Pre-reg. H.O. 53
Scotland. South-Eastern R.H.B. Cons. 45
Scotland. Western R.H.B. Regs. .. 53
South Cheshire H.M.C. Pre-reg. H.O. & Locum Reg. 54
South East Met. R.H.B. P.-t. Cons. 45/46
St. Albans City. Locum Reg. 54
Torquay. Torbay. Sr. H.O. 54
Wakefield. Pinderfields Gen. Sr. H.O. & Locum Sr. H.O. 55
Welsh R.H.B. Locum Cons. 46
West Bromwich & Dist. Gen. Pre-reg. H.O. 55
Wolverhampton Royal. Locum H.O. 55

THORACIC SURGERY
London Chest, E.2. Sr. H.O. 47
Bristol. Cossham/Frenchay H.M.C. Sr. H.O. 49
Oxford. United Hosps. H.O. 53
Scotland. Eastern R.H.B. Sr. Reg. .. 53

VENEREOLOGY
London, E.1. Sr. Reg. 47
North East Met. R.H.B. P.-t. Cons. 45

PUBLIC APPOINTMENTS 55

NON-MEDICAL 56

MISCELLANEOUS 56

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

COURSE IN ORTHOPÆDIC SURGERY

HARLOW WOOD ORTHOPÆDIC HOSPITAL, near MANSFIELD, NOTTS

29TH OCTOBER–2ND NOVEMBER, 1956

29th Oct.	Introduction ..	Mr. S. A. S. MALKIN
	The Rehabilitation of the Orthopædic Patient	Mr. S. A. S. MALKIN with Mr. J. D. MALLOCH
	Hand Surgery ..	Mr. R. G. PULVERTAFT
30th Oct.	The Replacement of Skin in Trauma	Mr. D. WYNN-WILLIAMS
	Some Aspects of Spinal Surgery in connection with the Relief of Pain	Mr. A. N. BIRKETT
	Hand Surgery ..	Mr. R. G. PULVERTAFT with Mr. D. A. REID
31st Oct.	The Management of Rheumatoid Arthritis by the Physician	Dr. J. M. MACFIE
	The Management of Rheumatoid Arthritis by the Surgeon	Mr. L. MORRIS
	Osteoarthritis of the Hip	Mr. J. P. CAMPBELL with Mr. D. H. MCMILLAN
1st Nov.	Anæsthetics in Orthopædics	Dr. A. G. HEGARTY
	The Acute Stage of Poliomyelitis	Dr. J. C. H. MACKENZIE
	Patterns of Paralysis and Deformity in Poliomyelitis	Mr. W. J. W. SHARRARD
	The Treatment of Tuberculosis of the Hip	Mr. J. P. JACKSON
2nd Nov.	Delayed Union and Non-union of Bone	Mr. S. M. THOMPSON
	The Treatment of Paraplegia	Mr. F. W. HOLDSWORTH
	Injuries of the Cervical Spine	Mr. ROLAND BARNES
	The Diagnosis and Prognosis in Malignant Bone Tumours	Sir HARRY PLATT

No fee for the course.

Applications to be sent to Secretary, Harlow Wood Orthopædic Hospital. Limited accommodation available, if required, at associated hospital.

THE INSTITUTE OF ACCIDENT SURGERY

(In conjunction with the Board of Graduate Studies, The Medical School, University of Birmingham)

A 2-DAY COURSE ON ANÆSTHESIA AND RESUSCITATION IN TRAUMA will be held at BIRMINGHAM ACCIDENT HOSPITAL THURSDAY and FRIDAY, 15TH–16TH NOVEMBER, 1956

PROGRAMME

Thursday, 15th November		
10.0 A.M.	Anæsthesia in Trauma (I)	Dr. L. J. WOLFSON
11.30 A.M.	Assessment of Blood Loss	Mr. RUSCOE CLARKE
2.0 P.M.	Anæsthesia in Burns ..	Dr. D. BIGLEY
3.0 P.M.	Acute Treatment of Major Injuries	Mr. P. S. LONDON
Friday, 16th November		
10.0 A.M.	Anæsthesia in Shock ..	Dr. L. J. WOLFSON
11.30 A.M.	Demonstration of Blood Volume and other research techniques	Dr. E. TOPLEY
2.0 P.M.	Anæsthesia in Trauma (II)	Dr. D. J. CARTER
3.15 P.M.	Discussion	

The Course is intended for Anæsthetists and others concerned with the treatment of injuries at the acute stage.

The fee (including lunch and tea) is 3 guineas.

Applications should be made to the Secretary, Mr. RUSCOE CLARKE, F.R.C.S., Institute of Accident Surgery, Birmingham Accident Hospital, Bath-row, Birmingham, 15.

PADDINGTON GROUP HOSPITAL MANAGEMENT COMMITTEE

THE TAVISTOCK CLINIC

INTRODUCTORY COURSE ON PSYCHOLOGICAL PROBLEMS IN GENERAL PRACTICE

A course of 8–10 weekly discussion meetings for a limited number of general practitioners will start in the AUTUMN. Day and time of meeting to be arranged to suit participants. Admission is free.

Apply in writing for further particulars to Medical Director, Tavistock Clinic, 2, Beaumont-street, W.1, stating possible times for attending.

DENTAL AND MEDICAL SOCIETY FOR THE STUDY OF HYPNOSIS

The above society will hold a STUDY GROUP ON THE THEORY AND PRACTICE OF HYPNOSIS beginning on WEDNESDAY, 3RD OCTOBER, 1956. 2-hour lecture-demonstrations will begin at 7.15 P.M.

An INTENSIVE WEEKEND COURSE will be held on 24TH and 25TH NOVEMBER for members who live too far away from London to attend the full course.

A fee is charged for these Study Groups.

The Society is prepared to send a team of lecturers and subjects to any locality in Great Britain to give an intensive weekend course provided that sufficient Medical and Dental practitioners are willing to attend.

Further details may be obtained from the Secretary, Mr. DAWSON WATTS, 22, Gordon-road, Ealing, W.5.

THE UNIVERSITY OF MANCHESTER.

Applications are invited for the post of SURGICAL TUTOR. Salary £900 p.a., with membership of children's allowance scheme. The Tutor will be required to give instruction in practical surgery and supervise the studies of students during their period of clinical apprenticeship. In addition the Tutor will be required to take part in the clinical and research activities of the Department of Surgery. A higher qualification in surgery will be considered an advantage.

Applications should be sent not later than 24th September to the Registrar, The University, Manchester, 13, from whom further particulars and forms of application may be obtained.

UNIVERSITY OF BRISTOL.

Applications are invited from registered medical practitioners for the new post of LECTURER IN FORENSIC PATHOLOGY in the University Department of Pathology. The duties include the conduct of autopsies, with special responsibility for those of medico-legal importance. The terms and conditions of the appointment will be those appropriate to a Clinical Lecturer and the commencing salary will be in the range of £1750–£100–£2400, together with superannuation and children's allowances. All fees received are to be paid to the University.

Applications, with the names of 3 referees, should be made to the undersigned, from whom further particulars may be obtained, not later than 1st October, 1956.

H. C. BUTTERFIELD, Registrar and Secretary.

UNIVERSITY OF EDINBURGH. Department of Clinical CHEMISTRY.

Applications are invited for a LECTURESHIP IN CLINICAL CHEMISTRY. Salary scale £700–£100–£1100 p.a. Bar: £1200–£100–£1600 p.a., with placement within the lower range according to qualifications and experience, and with superannuation benefit and family allowance where applicable. Applicants should have experience of hospital laboratory work and preferably some teaching experience. The duties include teaching clinical chemistry to undergraduates and sharing in the service provided to the hospitals. A medical qualification is desirable but not essential. The successful candidate will be expected to take up duty in January, 1957.

Further particulars may be obtained from the undersigned, with whom applications (6 copies), together with the names of 2 referees, should be lodged not later than 30th September, 1956. CHARLES H. STEWART, Secretary to the University.

UNIVERSITY OF GLASGOW.

Applications are invited for a LECTURESHIP IN BACTERIOLOGY. Salary according to placement on University scale for clinical teachers. The final maximum is £1750 p.a. F.S.S.U. and family allowance benefits.

Applications (12 copies) should be lodged, not later than 28th September, 1956, with the undersigned from whom further particulars may be obtained.

ROBT. T. HUTCHESON, Secretary of University Court.

AUSTRALIA. UNIVERSITY OF SYDNEY.

Applications are invited for the position of SENIOR LECTURER IN PATHOLOGY. The salary for a Senior Lecturer is within the range £1800–£70–£2150 (Australian) p.a., plus cost-of-living allowance (£52 men £39 women), and is subject to deductions under the State Superannuation Act. Commencing salary will be fixed according to the qualifications and experience of the successful applicant. Finance available for home purchase to married male members of staff.

Further particulars and information as to the method of application may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon-square, London, W.C.1. The closing date for the receipt of applications in Australia and London is 24th September, 1956.

Hospital Services: Senior Appointments

HOSPITALS FOR DISEASES OF THE CHEST.

The Board of Governors invites applications for the appointment of CONSULTANT RADIOLOGIST (diagnostic) tenable, in the first instance, at London Chest Hospital. Applicants must hold a Diploma in Diagnostic Radiology. The duties involve attendance on 3 half-days each week (Mondays, Wednesdays and Fridays) at the Hospital, Victoria Park, E.2, and 1 half-day in alternate weeks at the Hospital's Country Unit at Ariesey, near Letchworth.

Applications (12 copies), stating date of birth, qualifications and experience in full, with names of 3 referees, to reach the undersigned not later than 22nd September, 1956.

KENNETH A. F. MILES, Secretary to the Board.

Brompton Hospital, S.W.3.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) 2 CONSULTANT OPHTHALMOLOGISTS, each to undertake 2 half-days a week (outpatients) at West Middlesex Hospital, Isleworth (1139 Beds), and 1 half-day a week (operating session) at South Middlesex Hospital, Mogden-lane, Isleworth (ophthalmic ward of 29 Beds).

Applications before 8th October, 1956.

(2) CONSULTANT DERMATOLOGIST, 1 half-day a week, King Edward Memorial Hospital, Ealing (to include duties at Perivale Maternity and Clayponds Hospitals—total Beds 331).

Applications before 11th October, 1956.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

CARSTAIRS, LANARKSHIRE. STATE INSTITUTION AND MENTAL HOSPITAL. GENERAL BOARD OF CONTROL FOR SCOTLAND.

The Board invite applications for the post (Consultant status) of PHYSICIAN SUPERINTENDENT (Psychiatrist) at the above-mentioned Institution. Candidates must be fully qualified and registered medical practitioners. Experience in prisons or in dealing with mental patients or defectives who are dangerous is desirable. Salary £2100–£3100.

Application forms which must be returned by 1st October, 1956, from Secretary (Room 33), General Board of Control for Scotland, St. Andrew's House, Edinburgh, 1.

COLCHESTER. ESSEX COUNTY HOSPITAL. Locum RADIOLOGIST (Consultant or Senior Hospital Medical Officer grade) required immediately for a period up to 6 weeks, for duties at hospitals in the Colchester Group.

Applications to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

GLOUCESTER. BARNWOOD HOUSE REGISTERED HOSPITAL (outside the National Health Service). Applications are invited for the post of DEPUTY MEDICAL SUPERINTENDENT. Candidates should possess the D.P.M., and, if possible, the M.R.C.P. The successful candidate will be expected to take an active part in the research work of the Hospital, in addition to routine medical duties. Salary (with emoluments) according to experience and qualifications. Pension scheme.

Applications, together with names of personal referees, and stating experience, present salary and nationality, to be sent to the Medical Superintendent before 16th September, 1956.

LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for the post of Part-time CONSULTANT ANÆSTHETIST on maximum sessions with duties mainly at hospitals in the St. Helens and Warrington Groups. Candidates must have had at least 5 years recognised training and experience in anæsthesia, and must be Fellows of the Faculty of Anæsthetists, or already hold a Consultant post.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 22nd September, 1956.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Whole-time or maximum Part-time ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer) to the West Manchester Group of hospitals (mainly at Park Hospital, Davyhulme, Manchester, acute, 433 Beds including regional thoracic surgery centre). Wide experience, higher qualification essential, appointee to live near main hospital. 17th September, 1956.

(*b*) Whole-time NON-RESIDENT ASSISTANT OPHTHALMOLOGIST (Senior Hospital Medical Officer) to the Ophthalmic Department, Victoria Hospital, Burnley, and associated School Eye Clinics in Burnley C.B. and Lancashire C.C. areas. About 4 sessions hospital and 7 sessions clinic work each week. 18th September, 1956.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

AMENDED ADVERTISEMENT

NEWCASTLE REGIONAL HOSPITAL BOARD. Cherry KNOWLE HOSPITAL, RYHOPE, near SUNDERLAND. (850 Beds.) ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer) whole-time. Candidates should normally hold a D.P.M. but applications will be considered from candidates with no previous practical experience in psychiatry who hold a higher medical qualification, have had wide experience in general medicine, including Senior Registrar posts, and intend to obtain a D.P.M. and specialise in psychiatry. The appointment is resident or non-resident. A small flat is available. If non-resident the successful candidate will be required to reside in close proximity to the Hospital. Full particulars from Regional Psychiatrist.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Benfield-road, Newcastle, 6, within 14 days.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Full-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer grade) at Chase Farm Hospital, Enfield, to work at Area Laboratory and other hospitals in Enfield Group.

Part-time CONSULTANT DERMATOLOGIST to Herts and Essex General (formerly Haymeads) Hospital, Bishops Stortford, Herts (1 session a week).

Part-time CONSULTANT DERMATOLOGIST to Chelmsford and Essex and Baddow Road Hospitals, Chelmsford (2 sessions a week).

Part-time CONSULTANT VENEREOLOGIST to Tilbury and Riverside Hospital, Tilbury (1 session a week).

Part-time CONSULTANT VENEREOLOGIST to Chelmsford and Essex Hospital, Chelmsford (1 session a week).

Applications (6 copies), and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 15th September.

OXFORD REGIONAL HOSPITAL BOARD. Consultant in E.N.T. Surgery (part-time, for 8 sessions a week) to the High Wycombe/Aylesbury Area Department. Duties mainly at High Wycombe and Amersham. The successful candidate must reside in the area. Applicants should have had wide experience in the specialty and hold the F.R.C.S. or equivalent.

Applications (10 copies), stating age, qualifications, experience, and the names of 3 referees, should reach the Secretary, 43, Banbury-road, Oxford, by 29th September, 1956.

OXFORD REGIONAL HOSPITAL BOARD. Assistant ANÆSTHETIST (whole-time, Senior Hospital Medical Officer grade) to the Oxford and Banbury Area Department. Duties mainly in the hospitals of the Banbury and District Hospital Management Committee. Applicants should hold a higher qualification in anæsthetics.

Applications (12 copies), stating age, qualifications, experience, and the names of 3 referees, should reach the Secretary, 43, Banbury-road, Oxford, by 29th September, 1956.

OXFORD. THE UNITED OXFORD HOSPITALS AND THE OXFORD REGIONAL HOSPITAL BOARD. Applications are invited for the post of Part-time CONSULTANT DERMATOLOGIST to the United Oxford Hospitals (4 sessions) and to the Oxford Regional Hospital Board (5 sessions).

Applications (10 copies), stating age, qualifications and experience, should reach the Administrator, The Radcliffe Infirmary, Oxford, from whom further particulars can be obtained, not later than 22nd September, 1956.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade), at Craig Dunain Hospital, Inverness. House available.

Forms of application and further particulars may be obtained from the undersigned with whom applications should be lodged by 29th September, 1956.

A. M. FRASER, M.D.
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. NORTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of PHYSICIAN-SUPERINTENDENT AND CONSULTANT PSYCHIATRIST at Kingseat Hospital, Newmachar, Aberdeenshire. Candidates should be possessed of an appropriate higher qualification and have wide experience in psychiatric work and mental hospital administration. The officer appointed will also be required to take part in the work of psychiatric clinics conducted in association with general hospitals in the Region. A residence, for which a rental is charged at an approved rate, is available in the grounds of the Hospital.

Further information relative to the appointment may be obtained from the Secretary of the Board, P.O. Box No. 28, 1, Albyn-place, Aberdeen, and applications (12 copies) together with the names of 2 referees, lodged with him not later than Monday, 1st October, 1956.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for a whole or maximum part-time appointment as CONSULTANT SURGEON to the West Fife Group of hospitals.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 22nd September, 1956. Further particulars on application.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT OPHTHALMOLOGIST required with duties at Leicester Royal Infirmary and associated clinics. Salary scale £1575–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, forms to be returned by 29th September, 1956.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PATHOLOGIST required based on Scunthorpe and District War Memorial Hospital. Appointee to commence on or after 1st January, 1957.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 22nd September, 1956.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PATHOLOGIST required based on Grimsby General Hospital. Duties will involve responsibility for public health and hospital bacteriology for the Grimsby area and considerable experience in these is essential. Some experience of morbid anatomy will also be required. Appointment to commence in January, 1957.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 22nd September, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT GENERAL SURGEON for 9 notional half-days a week in the Canterbury, Isle of Thanet, and St. Augustine's Groups of hospitals. The successful candidate will be required to reside in the Canterbury area. Candidates must have had wide experience in general surgery, and be Fellows of a Royal College of Surgeons. Applicants may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 15th September, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited to fill a vacancy for a CONSULTANT ANÆSTHETIST (part-time 4 notional half-days a week) at the Orpington and Sevenoaks Group of hospitals for duties at Orpington Hospital, Orpington, Kent. Candidates must have had wide experience in anæsthetics and hold the qualification of D.A. or preferably F.F.A.R.C.S. Applicants may visit the Hospital concerned.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 15th September, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for appointment as Part-time CONSULTANT in Physical Medicine to undertake 4 notional half-days a week in the Orpington and Sevenoaks Group of hospitals. Candidates should have had considerable experience in the specialty. A higher qualification in medicine is essential and the appropriate diploma is desirable. Applicants may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 15th September, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT in E.N.T. Surgery for 3 notional half-days a week, in the Orpington and Sevenoaks Group of hospitals, for duties at Orpington Hospital, Orpington, Kent. Candidates must have had wide experience in E.N.T. surgery and be Fellows of a Royal College of Surgeons. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the Hospital concerned.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 15th September, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT GENERAL SURGEON for 9 notional half-days a week in the South East Kent Group of hospitals. The successful candidate will be required to reside in the area. General surgical experience is essential. Special training and experience in urology would be an asset for candidates, who must be Fellows of a Royal College of Surgeons. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications, and experience, including details of present appointment and war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 15th September, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time ORTHOPÆDIST to the Mid-Sussex Group of hospitals for duties at the Heritage Craft Schools and Hospitals, North Chailey, Sussex. This is a comprehensive children's orthopædic organisation with both national and local functions. It comprises outlying clinics, a well-equipped hospital with complete orthopædic, pediatric and specialist consultant staff, open-air nursery, rehabilitation, boarding school, craft work, and resettlement. Candidates should have special interest in conservative and social orthopædics, and preferably in research in these subjects. Salary within the scale £1575–£50–£2025. Applicants may visit the Hospital and clinics.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, by 15th September, 1956.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires a Locum Tenens PÆDIATRICIAN (Consultant or Senior Hospital Medical Officer grade) for 9 sessions weekly for the Bournemouth and Salisbury Groups of hospitals from 29th September to 13th October, 1956, inclusive. Remuneration will be 5 guineas per session for Consultant grade and 3½ guineas per session for Senior Hospital Medical Officer grade.

Applications (3 copies), stating age, qualifications and experience together with the names and addresses of 3 referees, to the Area Secretary, Highcroft, Romsey-road, Winchester, Hants, by 15th September, 1956.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens CONSULTANT (general surgery) required Ebbw Vale Hospital, 1st–27th October, 1956.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

WELSH REGIONAL HOSPITAL BOARD. Consultant PÆDIATRICIAN to serve Clwyd and Deeside Hospital Management Committee area. Based at Royal Alexandra Hospital, Rhyl, expected serve other hospitals in Group. Optional whole-time/maximum part-time appointment.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 28 days.

WESTERN AUSTRALIA. ROYAL PERTH HOSPITAL.
SENIOR STAFF RADIOLOGIST.
STAFF RADIOLOGIST.

Applications are invited for the above full-time posts in Diagnostic Radiology. Candidates must be fully qualified Radiologists and preference will be given to those with higher qualifications.

Salary :

Senior Staff Radiologist : £A3100 p.a.

Staff Radiologist : Salary within the range of £A2360 p.a. to £A2540 p.a., according to qualifications and experience.

State Public Service Conditions, including superannuation, sick leave, &c.

The Royal Perth Hospital is a designated Medical Undergraduate Teaching Hospital ; it has more than 600 Beds and is extending.

The Senior Staff Radiologist will work under the overall direction of the Director of Radiology who will be a senior member of the Honorary Staff. The Senior Staff Radiologist will be responsible for duties of full-time staff ; internal management of the department ; training of technicians ; arrangement of demonstrations and provision of radiological teaching material.

A memorandum of further particulars concerning these posts will be supplied on request.

Applications must include particulars of qualifications, experience, age, marital status, war service if any, and the names of 2 referees, and should reach the undersigned on or before 30th September, 1956.

JOSEPH GRIFFITH, Administrator.

VIRGINIA, U.S.A. Progressive state mental hospital (4600 Beds) in Virginia expanding staff invites applications for PHYSICIANS at all levels, psychiatric experience desirable but not necessary. Salary from $8040 (approximately £2750). All modern methods of treatments. Opportunities for research. Good retirement plan.

Apply to BRIAN C. CAMPDEN-MAIN, M.R.C.S. Send full résumé in first letter. Box 271, Petersburg, Virginia, U.S.A.

Hospital Services : Junior Appointments

ARCHWAY GROUP HOSPITAL MANAGEMENT COMMITTEE. ISLINGTON CHEST CLINIC. REGISTRAR required for duties in Chest Clinic and beds at Whittington Hospital, N.19. Previous experience in treatment of tuberculosis essential. Clinic and Hospital may be visited by appointment.

Application forms obtainable from, and returnable to, Group Secretary, 46, Cholmeley-park, N.6, by 14th September, 1956.

ARCHWAY GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum Tenens ORTHOPÆDIC REGISTRAR required for a period of 3 months.

Write or call, Medical Superintendent, Whittington Hospital, N.19 (ARC. 3070, ext. 100).

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. HOUSE SURGEON/CASUALTY OFFICER (combined post), resident, vacant immediately. House Officer grade, not pre-registration and not recognised for F.R.C.S.

Apply, enclosing copies of 2 recent testimonials, to Hospital Secretary with whom arrangements can be made to view the Hospital.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, E.2. (Acute General—309 Beds.) HOUSE PHYSICIAN required. Post recognised for pre-registration purposes.

Applications, stating age, experience, qualifications and copies of 2 testimonials, to the Hospital Secretary.

BROMPTON HOSPITAL, S.W.3. Applications invited for the following posts :—

RESIDENT SURGICAL OFFICER (post graded as Senior House Officer or Registrar, according to qualifications and experience), for which there are 2 vacancies, for 6 months from 1st November, 1956, with eligibility for re-appointment. Candidates must have held a resident hospital appointment.

RESIDENT HOUSE PHYSICIAN (4 vacancies). 3 vacancies for 6 months from 1st November, 1956. Duties include work in Outpatient Department and wards. 1 vacancy for 9 months from 1st November, 1956. The first 3 months at Brompton Hospital Sanatorium, Frimley, and the following 6 months at the Hospital in London covering work in Outpatient Department and wards. Salary at the rate of £525 p.a.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 8th September, 1956, to—

KENNETH A. F. MILES, House Governor.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR (whole-time), non-resident, Orthopædic and Traumatic Department at above Hospital. Duties include teaching and visiting convalescent hospital and area orthopædic clinics. Opportunity of gaining at least 12 months experience of long-stay orthopædic cases at Heatherwood Orthopædic Hospital, Ascot. Applicants should be F.R.C.S. Post now vacant. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Central Middlesex Group Hospital Management Committee, Park Royal, N.W.10, by 8th September, 1956.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) Applications are invited for the post of SECOND CASUALTY OFFICER with duties in the Department of Orthopædic and Traumatic Surgery (Senior House Officer grade). Recognised for F.R.C.S. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of HOUSE SURGEON to Gynæcological Department (recognised for M.R.C.O.G.). Duties to commence 1st November, 1956. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital by 12th September, 1956.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of SECOND HOUSE PHYSICIAN. Appointment for 6 months from 1st November, 1956. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 12th September, 1956.

HAMMERSMITH HOSPITAL AND INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY AND NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. (Joint appointment.) Whole-time NON-RESIDENT REGISTRAR (obstetrics and gynæcology) required 1st October. Appointment tenable for minimum period of 2½ years of which first 9 months will be spent at Hammersmith Hospital, the next 12 months at Luton Maternity Hospital (resident if required) returning to Hammersmith Hospital for final 6 months.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, The Hammersmith, West London and St. Mark's Hospitals, Ducane-road, London, W.12, by 8th September.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. 5 HOUSE PHYSICIANS (general medicine) required 1st November. 2 of these posts will give experience in rheumatism and neurology.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary, Board of Governors, by 10th September.

HACKNEY HOSPITAL, London, E.9. (General—341 Beds.) Applications are invited for appointment as SENIOR HOUSE OFFICER ANÆSTHETIST. The post, shortly vacant, is recognised for the D.A. and the F.F.A.R.C.S. examinations and offers wide experience of anæsthesia and opportunities of study for higher qualifications.

Apply Secretary, above address, by 24th September, quoting HH/SHO/A.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited for the following pre-registration posts :—

HOUSE PHYSICIAN.
HOUSE SURGEON.

Both vacant 1st October, 1956, and tenable for a period of 6 months.

Application forms may be obtained from the Secretary, to whom they should be returned, together with copies of 3 recent testimonials, by 5th September, 1956.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered medical practitioners for the post of RESIDENT CASUALTY OFFICER (graded as Senior House Officer). Salary £745 p.a. Tenable for a period of 6 months at the Main Outpatients Department, Bayham-street, N.W.1.

Application forms may be obtained from the Secretary, to whom they should be returned, together with copies of 3 recent testimonials, by 5th September, 1956.

HIGHLANDS GENERAL HOSPITAL, Winchmore-hill, London, N.21. SENIOR HOUSE OFFICER (resident for Chest Unit—100 Beds). Duties include tuberculosis work and investigation and treatment of chest diseases under supervision of the Finchley Chest Clinic.

Applications, with copies of 3 testimonials, to Hospital Secretary.

LAMBETH HOSPITAL, Brook-drive, S.E.11. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the post of SURGICAL REGISTRAR. The appointment is normally for 2 years, but is subject to review at the end of 1 year. It is recognised for the F.R.C.S. Duties include general surgery and genito-urinary work. The post is resident or non-resident, but if the latter the successful applicant will be required to sleep in on nights on duty.

Forms of application (enclosing stamped addressed envelope) from the Secretary of the Hospital, to whom all applications should be returned not later than 15th September, 1956.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. A vacancy occurs for RESIDENT ASSISTANT PHYSICIAN at the Country Branch, Ariesey, near Letchworth. Appointment for 1 year from 1st November, 1956, and renewable. Post graded as Senior Registrar.

Applications, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned, from whom further particulars may be obtained, by 15th September.

THOMAS BROWN, House Governor.
London Chest Hospital, E.2.

LONDON CHEST HOSPITAL. Hospital for Diseases of THE CHEST. RESIDENT HOUSE SURGEON required at the Hospital's Country Branch, near Hitchin and Letchworth, Herts. The post is graded as Senior House Officer and the appointment, which provides excellent opportunities for experience in thoracic surgery, is for 6 months.

Applications from registered medical practitioners, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, to be forwarded at once to THOMAS BROWN, House Governor.
London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of SENIOR REGISTRAR to the Department of Venereal Diseases. A higher qualification in medicine is required. The appointment will be for 1 year in the first instance.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 30th September, 1956. H. BRIERLEY, House Governor.

MANOR HOUSE HOSPITAL, Golders Green, N.W.11 (exempted from National Health Service). Required, RESIDENT SURGICAL OFFICER (Male). Salary £745 p.a., less £130 p.a. for emoluments. 6 months appointment, renewable.

Applications, stating age, nationality, qualifications, and surgical or orthopædic experience, with copies of 3 recent testimonials, to the Secretary, Mr. W. F. PENDRILL.

MILE END HOSPITAL, Bancroft-road, London, E.1. (484 Beds.) HOUSE PHYSICIAN (pre- or post-registration). Post vacant 22nd September, 1956.

Application forms, obtainable from Physician-Superintendent, should be returned by 7th September, 1956, with copies of not more than 3 testimonials.

ROYAL MASONIC HOSPITAL, Ravenscourt Park, London, W.6. Applications are invited for the post of RESIDENT MEDICAL REGISTRAR. Appointment about 1st November. Gross salary : first year £850 (residential emoluments of £130 deductible) ; second year £965 (residential emoluments of £145 deductible).

Please state age, qualifications, past and present appointments and include 2 recent testimonials and/or the names of 2 referees. Applications should reach the undersigned (from whom further information may be obtained) as soon as possible, and in any event not later than 20th September.

R. E. LAWSON, Secretary and House Governor.

MOORFIELDS, WESTMINSTER AND CENTRAL EYE HOSPITAL (WESTMINSTER BRANCH), High Holborn, London, W.C.1. Applications are invited from Male practitioners for the post of RESIDENT SURGICAL OFFICER (Registrar grade). The successful candidate will be required to take up his duties on 1st December, 1956, and if recommended by the Medical Committee will be eligible for appointment as Senior Resident Surgical Officer for a period of 6 months from 1st December, 1957, making a total period of service of 18 months. Experience in ophthalmology is essential.

Forms of application are obtainable from the undersigned, to whom they should be returned with copies of not more than 3 testimonials, by 20th September, 1956.

J. P. HEMING, Secretary.

NORTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD.

ANÆSTHETIC REGISTRAR (resident or non-resident), Essex County Hospital, Colchester, Essex. Recognised for D.A. and F.F.A.R.C.S.

REGISTRAR in Pathology (non-resident), Prince of Wales's General Hospital, Tottenham, N.15.

SURGICAL REGISTRAR (resident or non-resident sleeping in on duty nights), Mile End Hospital, London, E.1. Recognised for F.R.C.S.

SURGICAL REGISTRAR (resident), General Hospital, Southend-on-Sea, Essex. Some duties at Victoria Hospital, Westcliff. Recognised for F.R.C.S.

SURGICAL REGISTRAR (resident, married quarters available), Chelmsford and Essex Hospital, Chelmsford, Essex. Post offers wide operative experience in elective and emergency surgery and is recognised for F.R.C.S.

REGISTRAR in Obstetrics and Gynæcology (resident), Ilford and Barking Group of hospitals, Essex.

REGISTRAR in Diseases of the Chest (resident), Broomfield Hospital, near Chelmsford, Essex. Modern hospital 312 Beds. Tuberculous and non-tuberculous surgery, chest clinics and mass radiography. Successful candidate required mainly for general ward and relief duties and to assist in Operating Theatre. Opportunities for study.

REGISTRAR in Diseases of the Chest (resident), Harts Hospital, Woodford Green, Essex.

REGISTRAR in Diseases of the Chest (resident), High Wood Hospital for Children, Brentwood, Essex. Experience in tuberculosis or diseases in childhood essential.

Appointments subject to review after 1 year.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 15th September, 1956.

PRINCESS BEATRICE HOSPITAL, Earls Court, S.W.5. Applications are invited from fully registered medical practitioners for the post of HOUSE PHYSICIAN for 6 months (Junior House Officer grade), resident.

Applications immediately with 3 testimonials to the House Governor.

ROYAL FREE HOSPITAL GROUP, Dental Department. Applications are invited for the appointment of a Full-time RESIDENT DENTAL REGISTRAR to work under the general supervision of the visiting Consultant Dental Surgeons. Duties would be of a varied nature, including opportunities for surgical theatre work. The appointment is for 1 year in the first instance, duties to commence as soon as possible. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Application should be made, stating qualifications, age and experience, and giving the names of 3 referees, to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 15th September, 1956.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered Women medical practitioners for the post of Full-time SURGICAL REGISTRAR (resident, or non-resident if living near the Hospital). Recognised for F.R.C.S. The post will become vacant on 31st October, 1956. The appointment is normally for 2 years, but subject to review at the end of the first year. Canvassing will disqualify, but candidates are not precluded from visiting the Hospital if they so desire.

For form of application apply (enclosing a stamped addressed envelope) to the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed applications should be returned not later than 15th September, 1956.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (593 Beds.) Applications are invited for the post of REGISTRAR (general medicine) whole-time, non-resident. Good clinical experience in general medicine essential. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary to Committee, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 17th September, 1956.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (593 Beds.) Applications are invited for the post of REGISTRAR (anæsthetic), whole-time, non-resident. A General Hospital with Departments of Thoracic, Plastic and Orthopædic Surgery. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary to Committee, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 17th September, 1956.

ST. JAMES' HOSPITAL, Balham, S.W.12. House PHYSICIAN required. Post vacant 1st October.

Applications, stating age, qualifications, experience and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address by 15th September. (42741.)

ST. NICHOLAS HOSPITAL, Plumstead, S.E.18. House PHYSICIAN, vacant 3rd October, 1956. Approved for Pre-registration Service.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. CLEMENT'S HOSPITAL, London, E.3. Senior House OFFICER required for Psychiatric Unit consisting of 24 observation beds and 36 beds for treatment of neuroses and early psychoses. Unit run in conjunction with the London and Claybury Hospitals. Post recognised for D.P.M. Vacant now.

Apply to Group Secretary, Bow Group Hospital Management Committee, Committee Offices, 2a, Bow-road, E.3, with the names of 3 referees.

ST. OLAVE'S HOSPITAL, Lower-road, Rotherhithe, S.E.16. BERMONDSEY AND SOUTHWARK HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required at above Hospital. Salary £745 p.a., appointment initially for a period of 1 year from 1st October, 1956. Post recognised for D.A. and F.F.A.R.C.S.

Applications, with full details and names of 2 referees, should be sent within 1 week of advertisement appearing, to the Secretary at above address.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 15th December, 1956, for a HOUSE PHYSICIAN (Senior House Officer).

Further particulars and form of application, which must be returned not later than 10th October, 1956, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

AMENDED ADVERTISEMENT

WHITTINGTON HOSPITAL. Clinical Assistant (General Practitioner) required at above Hospital to assist in Skin Outpatient Clinic 2 hours weekly (Monday morning).

Application forms obtainable from Group Secretary, Archway Group Hospital Management Committee, 46, Cholmeley-park, N.6, and returnable to the Medical Superintendent, Whittington Hospital, London, N.19, by 10th September.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICERS (anæsthetics). 1 at St. Nicholas Hospital, Plumstead, and 1 at Memorial Hospital, Woolwich, vacant immediately. Both posts recognised for F.F.A.R.C.S. or D.A. and are for 6 months in the first instance and may be renewed.

Apply to Group Secretary, Memorial Hospital, Shooters Hill, Woolwich, S.E.18.

ABERDEEN SPECIAL HOSPITALS BOARD OF MAN-AGEMENT. Fully registered HOUSE OFFICER required for the Aberdeen Maternity Hospital and associated Homes. The period of appointment is for 6 months commencing on 22nd October, 1956.

Applications, stating experience and giving the names of 2 referees, should be sent to Dr. JOHN MORRISON, Group Medical Superintendent, Aberdeen Special Hospitals, Sick Children's Hospital, Westburn-drive, Aberdeen, before 15th September, 1956.

ABERDEEN SPECIAL HOSPITALS BOARD OF MANAGEMENT. 1 HOUSE OFFICER (pre- or post-registration) required immediately. The post offers experience mainly in eye and skin conditions and is classified for pre-registration purposes as quasi-medical. It is tenable for 6 months from 1st August, 1956.

Applications, with full details, to Group Medical Superintendent, Royal Aberdeen Hospital for Sick Children, Westburn-drive, Aberdeen.

ALTON GENERAL HOSPITAL, Alton, Hampshire. (136 Beds.) HOUSE SURGEON (Senior House Officer grade) required to assist in busy and expanding surgical unit at this Hospital which is being developed. Work includes casualty duties. The post is recognised for the F.R.C.S. This post offers good experience in both general and gynæcological surgery.

Applications, with copies of 2 testimonials, to be sent to the Hospital Secretary.

ALTON, HAMPSHIRE. LORD MAYOR TRELOAR ORTHOPÆDIC HOSPITAL. (340 Beds.) Applications are invited from SENIOR ORTHOPÆDIC REGISTRARS who desire a years experience in the same grade at a long-stay orthopædic hospital. Post includes attendance at peripheral clinics. Residence available.

Write to Secretary for application form.

ALTON, HAMPSHIRE. HENRY GAUVAIN HOSPITAL. Locum REGISTRAR (general surgery and orthopædics) required at the above Hospital early in September.

Applications as soon as possible to the Secretary, Henry Gauvain Hospital, Alton.

ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) SENIOR HOUSE OFFICER (medical). This appointment is in a busy hospital and offers excellent opportunities of practical experience. Post vacant end of September.

Applications, together with 2 recent testimonials, to Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for general surgical and medical duties. 6 months appointment, vacant 15th September, 1956, not suitable for pre-registration candidates.

Applications, stating age, qualifications, and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT SENIOR HOUSE OFFICER (Male) for Pathology. Previous clinical experience essential but pathological experience not essential. Post vacant 1st November, 1956.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

BEXHILL. BEXHILL HOSPITAL. (62 Beds.) House SURGEON (resident) not pre-registration post. National scale of salary.

Apply to Hospital Administrator.

BEDFORD (near). BROMHAM HOSPITAL. (434 Beds for mental defectives and 60 at Annexe near Sandy.) REGISTRAR in Psychiatry required (resident). Hospital may be visited by direct appointment with the Medical Superintendent (phone : Oakley 295).

Application forms obtainable from, and returnable to, Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 17th September, 1956.

BEDFORD GENERAL HOSPITAL. (439 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. GENERAL SURGICAL REGISTRAR (resident) required at above Hospital which may be visited by direct appointment. Post vacant October.

Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, as soon as possible.

BEDFORD GENERAL HOSPITAL. (439 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Locum GENERAL SURGICAL REGISTRAR required at above Hospital, 16th September, 1956.

Applications, giving full details of experience and names of 2 referees, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (439 Beds.) Senior HOUSE OFFICER in Medicine, now vacant, tenable for 12 months.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) HOUSE PHYSICIAN (House Officer or Senior House Officer grading according to experience), vacant end of September. Pre-registration post but fully qualified practitioners may apply.

Applications to Group Secretary.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (780 Beds.) SENIOR HOUSE OFFICER (anæsthetics) required, resident. Recognised for D.A. and F.F.A.R.C.S. Extensive experience of anæsthetics not necessary. Duties include list and emergency work in general surgery, gynæcology, obstetrics and E.N.T. at hospitals in Group. Vacant 21st October, 1956.

Detailed applications, with copies of 3 recent testimonials, to Group Secretary.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Mid-Worcestershire Group, Bromsgrove General Hospital, Birmingham-road, Bromsgrove**

REGISTRAR (obstetrics/gynæcology). Duties in Mid-Worcestershire Group at Bromsgrove Hospital (423 Beds) (7 notional half-days), and Dudley and Stourbridge Group (4 notional half-days).

(2) **Wolverhampton Group, Royal Hospital, Wolver-hampton**

REGISTRAR (orthopædic and traumatic surgery). All types of traumatic and orthopædic conditions, also industrial accident work and rehabilitation which is carried out at a special unit of 60 Beds.

Application forms from Group Secretaries, to be returned by 10th September, 1956.

BIRMINGHAM (SANATORIA) GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at West Heath Hospital, Rednal-road, Birmingham, 31 (210 tuberculosis with observation beds). The successful applicant will reside at the above Hospital (accommodation for single person only), and will be offered facilities for undertaking duties at the Birmingham Chest Clinic, Great Charles-street, Birmingham, 3.

Applications, stating age, qualifications, training and experience, together with copies of 3 recent testimonials, should be addressed to the Group Secretary, Birmingham (Sanatoria) Group Hospital Management Committee, Yardley Green Hospital, Birmingham, 9.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (955 equipped beds.) SENIOR HOUSE OFFICER (anæsthetics), resident/non-resident. Residential charge £150 p.a.

Apply Medical Superintendent, with details of qualifications, experience, age and copies of 3 recent testimonials.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. Applications are invited for the appointment of SENIOR REGISTRAR (E.N.T. Department), non-resident, for duties within the United Hospitals. Higher qualification in the specialty necessary. The appointment will be for 1 year in the first instance and subject to annual review. The successful candidate may subsequently be required to spend not more than 2 years in a selected hospital of the Birmingham Regional Hospital Board in accordance with an arrangement for the interchange of Registrars agreed between the 2 Boards.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned not later than 15th September, 1956.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Locum Tenens SURGICAL REGISTRAR required from 10th September for 3 weeks.

Apply immediately, in writing or in person, to the House Governor.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. Applications are invited for the post of RESIDENT REGISTRAR in Anæsthetics to the United Birmingham Hospitals. The appointment is tenable for 1 year in the first instance. Preference will be given to candidates who have passed Part I, D.A., or Primary F.F.A.R.C.S.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him by 15th September, 1956.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds and 8 House Surgeons.) HOUSE SURGEONS (resident), vacant September. Recognised for purpose of Casualty by R.C.S. (Eng.). Teaching programme by Consultant staff. Appointment for 6 months, some of which may be spent, at applicant's request, in 42-Bedded Medical Research Council's Burns Unit.

Apply within 7 days of advertisement to Administrator naming 2 referees.

BIRMINGHAM, 15. ROYAL ORTHOPÆDIC HOSPITAL. (Recognised by Royal College of Surgeons. 336 Beds for long and short term orthopædic cases (non-traumatic) and extensive outpatient services.) SENIOR HOUSE OFFICER, registered medical practitioner preferably with orthopædic experience. Residential charge £150 p.a.

Applications, with testimonials or names of referees, to Administrator.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (Senior House Officer grade), tenable for 12 months. Successful candidate will be required to reside at Hulton Hospital (141 Beds). Married quarters available. Duties include care of infectious and dermatological cases and some surgical and geriatric cases and may include outpatients and inpatients duties in the hospitals of the Group.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. BOLTON ROYAL INFIRMARY (237 Beds), **BOLTON DISTRICT GENERAL HOSPITAL** (604 Beds). RESIDENT SENIOR HOUSE OFFICERS in Medicine (2), 1 for each of the above Hospitals. Both vacant early September and tenable for 12 months.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (494 Beds.) **BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the appointment of SENIOR HOUSE OFFICER (resident), orthopædic and casualty combined. The post which is now vacant is recognised for the F.R.C.S. examination and is normally tenable for 12 months.

Applications to the Hospital Secretary.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. Locum REGISTRAR in Orthopædic and Renal Tuberculosis required from 1st to 28th October, 1956.

Applications to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE GROUP HOSPITALS. (78 Beds.) SENIOR HOUSE OFFICER for duties in the E.N.T. Department of the above Group. Recognised for F.R.C.S. and D.L.O.

Applications, stating usual particulars, together with the names of 2 referees, to be sent to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required in the Thoracic Surgery Department, which is the Regional Thoracic Surgery Centre (120 Beds) for the South West.

Applications, with full particulars, should be addressed to the Group Secretary, Frenchay Hospital, Bristol, quoting "Thoracic."

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (542 staffed beds, expanding.) Applications are invited for the post of SENIOR HOUSE OFFICER in the Regional Department of Neurosurgery. Vacant end of September. This post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis. Recognised for F.R.C.S.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." 2 referees required.

BROXBURN, WEST LOTHIAN. BANGOUR GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics), vacant November. Post recognised for D.A. and F.F.A.R.C.S.

Applications, naming 2 referees, to the Secretary and Treasurer, West Lothian (Bangour) Group Hospitals, Broxburn, West Lothian, by 17th September.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. ROSSENDALE GENERAL HOSPITAL, RAWTENSTALL. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics and gynæcology).

Apply, stating age, qualifications, and experience, together with names of 2 referees, to H. WILKINSON, Group Secretary. Bury General Hospital, Bury, Lancs.

BURY. FAIRFIELD GENERAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry). The appointment is for 1 year in the first instance, subject to renewal annually. This post is recognised for the D.P.M. for 12 months.

Applications, with full details of age, qualifications and experience, together with names of 2 referees, should be submitted to— H. WILKINSON, Group Secretary, Bury and Rossendale Hospital Management Committee. Bury General Hospital, Bury.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (108 Beds—Acute.) RESIDENT SENIOR HOUSE OFFICER (surgical) required at the above Hospital (approved for F.R.C.S.). Excellent surgical experience is available. Salary in accordance with Whitley Council scale.

Applications, giving full particulars, age, qualifications, experience, &c., together with 3 names for reference, to be sent to the Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich, Cheshire.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Non-RESIDENT RADIOTHERAPEUTIC REGISTRAR in the grade of Senior Registrar, now vacant. D.M.R.T. essential.

Apply, with full particulars and names of 3 referees, to Secretary by 15th September.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Senior MEDICAL REGISTRAR for 1 year in first instance reviewable annually.

Apply, with full particulars and names of 3 referees, to Secretary by 8th September.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of PÆDIATRIC HOUSE PHYSICIAN, recognised for D.C.H., includes work in the ward and Outpatient Department and also provides experience in the care of the newborn. Opportunities exist for the study of preventive medicine among children and child guidance work. Post vacant at the end of September, 1956. National Health Service salary and conditions.

Applications, together with 2 testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of GENERAL SURGICAL AND ORTHOPÆDIC HOUSE SURGEON, which is recognised for the F.R.C.S. Diploma, is now vacant. National Health Service salary and conditions.

Applications, together with 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF. ROYAL HAMADRYAD GENERAL AND SEAMEN'S HOSPITAL. RESIDENT SENIOR HOUSE OFFICER (surgical) required at above Hospital. Locum appointment if desired. Post covers 44 Beds—genito-urinary, general surgery and outpatients. Department under care of Consultants from United Cardiff Hospitals.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARLISLE. GARLANDS HOSPITAL. (1060 Beds.) GARLANDS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER at the above Mental Hospital. Salary £745 p.a. Flat is available for which a deduction will be made. Appointment is subject to the National Health Service superannuation regulations and to the conditions and terms of service laid down by the Minister of Health.

Applications, stating age, qualifications and experience, and the names of 2 referees, should be sent to the Medical Superintendent as soon as possible.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. HOUSE SURGEON (pre-registration post), general surgery with duties in genito-urinary. Vacant end September.

Applications, giving age, qualifications, &c., with copies of recent testimonials and the names of referees, should be sent to the Secretary at above address.

CHELMSFORD. ST. JOHN'S HOSPITAL. House PHYSICIAN (pre-registration, first, second, or third appointment), Male or Female, to commence 24th September, 1956.

Applications, stating age, nationality, qualifications and experience, together with recent testimonials, should be received not later than 5th September by the Secretary, Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHEPSTOW, MONMOUTHSHIRE. ST. LAWRENCE HOSPITAL. (127 plastic surgery, 50 orthopædic beds.) **PLASTIC SURGERY, JAW INJURIES AND BURNS CENTRE.** SENIOR HOUSE OFFICER in Plastic Surgery required. Previous experience in specialty not essential. The Hospital intakes from most of Wales and the successful candidate will receive a thorough training. There is a second Senior House Officer in plastic surgery and also a Senior House Officer in orthopædics, Senior Registrar, non-resident, and 2 Registrars, all in plastic surgery, resident. Salary £745, less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary, 64, Cardiff-road, Newport, Mon.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL. (430 Beds.) ANÆSTHETIC REGISTRAR required from end October. Post recognised for F.F.A.R.C.S. and D.A. Hospital may be visited by arrangement with Physician-Superintendent (Tel.: Ottershaw 441).

Application forms from Secretary, Woking and Chertsey Hospital Management Committee, "Huntington," Chertsey, Surrey. Closing date 12th September.

CHESTERFIELD ROYAL HOSPITAL. (324 Beds. Recognised for the D.A. and F.F.A.R.C.S.) **SHEFFIELD REGIONAL HOSPITAL BOARD.** Whole-time RESIDENT REGISTRAR (anæsthetics) with additional duties when required at other hospitals in the group. Experience in all types of anæsthesia, except for neurosurgery, can be obtained in this group of hospitals. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 10th September, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

COLCHESTER. ESSEX COUNTY HOSPITAL. (188 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (anæsthetics). Post tenable for 1 year. Recognised for F.F.A.R.C.S. and D.A. The successful candidate will be called upon to give anæsthetics in other hospitals in the Group.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COULSDON, SURREY. NETHERNE HOSPITAL. Applications are invited for the post of Locum REGISTRAR. All modern forms of treatment carried out in this Hospital of 2000 Beds which is recognised for the D.P.M. The Physician-Superintendent will give further information or arrange for the Hospital to be visited.

Application forms from Secretary.

COULSDON, SURREY. NETHERNE HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER. All modern forms of treatment carried out in this Hospital of 2000 Beds which is recognised for the D.P.M. The Physician-Superintendent will give further information or arrange for the Hospital to be visited.

Apply for application forms from Secretary without delay.

COULSDON, SURREY. CANE HILL HOSPITAL. Cane HILL HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Psychiatry, whole-time, resident (if unmarried) or non-resident. The Hospital has 4 outpatient clinics and undertakes postgraduate teaching in association with the Institute of Psychiatry. Every facility will be given for further study. Candidates may visit the Hospital by arrangement with the Physician-Superintendent.

Application forms, returnable within 14 days, may be obtained from the Group Secretary.

CROYDON. MAYDAY HOSPITAL. Croydon Group HOSPITAL MANAGEMENT COMMITTEE. Locum Tenens MEDICAL REGISTRAR (whole-time), 19th September–12th October, 1956, inclusive. Non-resident. Previous experience in general medicine essential.

Applications in writing, giving age, experience, and names of 2 referees, to— GEORGE A. PAINES, Group Secretary, Croydon Hospital Management Committee. General Hospital, London-road, Croydon.

DERBY CITY HOSPITAL. Obstetric House Surgeon (pre-registration) or SENIOR HOUSE OFFICER for duties at the Derby City Hospital (73 obstetric beds) and some duties at the Queen Mary Maternity Home (36 Beds). Post vacant 25th September, 1956.

Apply, stating age, qualifications and experience, with copies of 2 testimonials, to the Medical Superintendent.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds. Derby Group recognised for training for F.F.A.R.C.S. and D.A.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics) required. Duties will include attendances at other hospitals in the Group. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 10th September, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DONCASTER ROYAL INFIRMARY. (330 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST in the grade of Senior House Officer. Duties to commence beginning of October.

Applications to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

(1) SURGICAL REGISTRAR, Ipswich and East Suffolk Hospital. Recognised for F.R.C.S. Appointment for 1 year, renewable for second year.

(2) SURGICAL REGISTRAR, West Norfolk and King's Lynn General Hospital (146 Beds). Recognised for F.R.C.S. Appointment for 1 year, renewable for second year.

(3) ANÆSTHETIC REGISTRAR, Ipswich and East Suffolk Hospital. Recognised for D.A. and F.F.A.R.C.S. Appointment for 1 year, renewable for second year.

Applications, stating age, experience and the names of 3 referees, to Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 10th September, 1956. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at Hospital.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. RESIDENT OBSTETRIC HOUSE SURGEON for above Hospital. Post vacant 16th October, 1956. 6 months appointment. Post recognised for M.R.C.O.G. purposes.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 8th September, 1956.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. RESIDENT GYNÆCOLOGICAL HOUSE SURGEON for above Hospital. Post vacant 11th October, 1956. 6 months appointment. Post recognised for M.R.C.O.G. purposes.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 8th September, 1956.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. Locum CASUALTY SENIOR HOUSE OFFICER required for 2 weeks from 23rd September, 1956, at above Hospital.

Apply immediately to Medical Director (Telephone : EDGware 2381).

EPPING. ST. MARGARET'S HOSPITAL. (480 Beds.) Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN at the above Hospital as from 23rd September, 1956. The appointment, which is in general medicine, is for 6 months including duties at Honey Lane Hospital, for part of this time.

Applications, with 2 recent testimonials, immediately to the Group Secretary, Epping Group Hospital Management Committee, Oak Cottage, The Plain, Epping, Essex.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. SENIOR HOUSE OFFICER (casualty) required 1st October, 1956. Post non-resident, recognised for F.R.C.S. 12 months appointment. Busy Casualty and Outpatient Department with excellent experience in minor and traumatic surgery. Candidates should have held previous House Officer posts.

Applications, stating age, qualifications, experience, with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

FARNBOROUGH HOSPITAL, Kent. (800 Beds.) Senior HOUSE OFFICER in Anæsthetics required immediately for 1 year. Recognised for D.A. and F.F.A.R.C.S.

Apply, stating age, qualifications with dates and experience and naming 3 referees, to Administrative Officer.

EDINBURGH. PRINCESS MARGARET ROSE HOSPITAL. Applications are invited from registered medical practitioners and pre-registration graduates for the appointment of RESIDENT HOUSE SURGEON for 6 months commencing 1st October, 1956. National Health Service scale.

Applications, stating age, qualifications, and experience, and names of 2 referees, to be sent immediately to Medical Superintendent, 18, Rillbank-terrace, Edinburgh, 9.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) SENIOR HOUSE OFFICER required for E.N.T. Department. Post is recognised for the D.L.O. examination. Vacant 17th September, 1956.

Applications, with copies of 3 testimonials, should be sent as soon as possible to the Hospital Secretary.

GUILDFORD. ST. LUKE'S HOSPITAL. Guildford GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR (obstetrics and gynæcology), 1 of 2, at above Hospital. Post offers extensive experience in obstetrics and gynæcology and flying squad service. Possession of higher qualification an advantage. Unit is recognised for M.R.C.O.G.

Application forms from Secretary, Guildford Group Hospital Management Committee, St. Luke's Hospital, Guildford, to whom they should be returned by 15th September, 1956.

HAREFIELD HOSPITAL, Harefield. Thoracic Surgical UNIT. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident) required. Applicants should have held previous hospital appointments and have had special experience in the administration of anæsthetics. They should be working for, or be in possession of, the D.A. qualification. The duties of the post will afford an opportunity of acquiring very considerable experience in anæsthesia for thoracic surgery. (The Thoracic Surgical Unit at this Hospital serves the North West Metropolitan Region.) They will also include occasional anæsthesia for E.N.T., dental and general surgery. The Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, not later than 11th September, 1956.

HAYWARDS HEATH. HURSTWOOD PARK HOSPITAL. SENIOR HOUSE OFFICER (neurology), resident, required at the above Hospital. Accommodation for married man. Duties primarily neurological but the person appointed may be expected to give occasional assistance in the psychiatric departments. Salary in accordance with the terms and conditions of service with appropriate deduction for residence.

Applications, with the names and addresses of 3 referees, to the Secretary to the Hospital Management Committee, St. Francis Hospital, Haywards Heath, Sussex.

HEMEL HEMPSTEAD. WEST HERTS AND ST. PAUL'S HOSPITALS. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Obstetrics and Gynæcology (resident) required at above Hospitals which may be visited by direct appointment. Post vacant immediately.

Application form obtainable from, and returnable to, Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 10 days after the appearance of this advertisement.

HILLINGDON HOSPITAL, Uxbridge, Middlesex. (621 Beds.) CASUALTY OFFICER—whole-time duties under Medical Director will include dealing with casualties and admissions to Hospital and such other duties as may be required. Post recognised for F.R.C.S. Salary on Junior Hospital Medical Officer scale.

Apply, with copies of 3 recent testimonials, to Medical Director by 11th September.

HOLT, NORFOLK. KELLING HOSPITAL AND DEPARTMENT OF THORACIC SURGERY. Applications are invited for the appointment of Locum JUNIOR HOSPITAL MEDICAL OFFICER (minimum of 4 months). This Hospital (180 Beds) deals with tuberculous and non-tuberculous chest conditions and offers excellent experience in chest medicine and thoracic surgery.

Applications, stating age, sex, qualifications, nationality, and experience, together with names of 2 referees, to the Group Secretary, Cromer Area Hospital Management Committee, Cliff-avenue, Cromer, Norfolk, who will be pleased to supply any other information concerning the appointment.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) Applications are invited for the post of CASUALTY OFFICER. The post, which is resident, is recognised under the Fellowship regulations and will be graded either Junior Hospital Medical Officer or Senior House Officer according to experience. Duties terminate at 7 P.M. daily with 1 night weekly on call.

Applications for the appointment, which will be vacant on 1st October, 1956, should be accompanied by copies of 3 recent testimonials and addressed to—

H. J. JOHNSON, Group Secretary.
The Royal Infirmary, Huddersfield.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (medical). Post recognised for pre-registration purposes. The selected candidate will be required to look after medical and paediatric cases and may be called upon to give emergency anæsthetics. Post vacant beginning of October.

Apply, with full particulars and names of 2 referees, to Secretary, County Hospital, Huntingdon.

HULL A GROUP HOSPITAL MANAGEMENT COM-MITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the E.N.T. Department of the Victoria Hospital for Sick Children and the Hull Royal Infirmary. The post is recognised for the F.R.C.S. and D.L.O.

Applications, with testimonials, should be sent to the Secretary, Victoria Hospital for Sick Children, Park-street, Hull.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required for the above Hospital. Registration or pre-registration post. 6-monthly term. Recognised for the D.C.H. qualification. Salary according to national scale.

Replies, with testimonials, should be sent to the Hospital Secretary.

HASTINGS AND ST. LEONARDS. BUCHANAN HOSPITAL. (94 Beds.) HOUSE SURGEON in Gynæcology (28 gynæcological beds). Post recognised for M.R.C.O.G., vacant 22nd September for 6 months. Candidates for Pre-registration Service (surgery) can be considered.

Apply, giving names of 3 referees, to Hospital Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) SENIOR HOUSE OFFICER (casualty and orthopædic). Post vacant now.

Apply to Hospital Administrator.

ILFORD. KING GEORGE HOSPITAL. There is a vacancy for a CLINICAL ASSISTANT in the Psychiatric Department at above Hospital. 2 sessions per week (Tuesday). Applicant must be able to carry out psychotherapy treatment and must also have had experience in child guidance. Remuneration in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), i.e., £175 p.a. per weekly half-day.

Applications, accompanied by testimonials, to be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary,
Ilford and Barking Group Hospital Management Committee.
King George Hospital, Ilford.

ILFORD. KING GEORGE HOSPITAL, Eastern-avenue, ILFORD. There will be a vacancy for a HOUSE PHYSICIAN at above Hospital on 5th October, 1956. First or second post pre-registration. The post will be tenable for 6 months.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary,
Ilford and Barking Hospital Management Committee.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. Locum Tenens CASUALTY OFFICER (Senior House Officer grade) required from 2nd to 31st October, 1956.

Applications with full particulars to Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. (1139 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (Medical Unit), vacant now. Whole-time, non-resident. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 17th September, 1956.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. Pre-registration HOUSE OFFICER required for Orthopædic Unit. Post recognised for F.R.C.S. Resident.

Applications, stating age, nationality, qualifications obtained, with copies of up to 2 recent testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, Middlesex, by 10th September, 1956.

LICHFIELD. ST. MATTHEW'S HOSPITAL, Burntwood, LICHFIELD. (1350 mental beds.) BURTON-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry) required. Resident accommodation available. Facilities for taking a D.P.M. course at Birmingham University.

Applications, with names of 2 referees, to Medical Superintendent.

LOUTH COUNTY INFIRMARY. (215 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (orthopædics and casualty) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 10th September, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LUTON AND DUNSTABLE HOSPITAL. CHILDREN'S ANNEXE, LUTON, BEDFORDSHIRE. RESIDENT PÆDIATRIC HOUSE OFFICER required early October. The post is recognised for the D.C.H., and as a second pre-registration post in medicine. The duties will cover both medical and surgical wards.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds, by 10th September, 1956.

LEICESTER (near). MARKFIELD HOSPITAL. (163 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR or SENIOR HOUSE OFFICER (chest diseases) required. Duties will include attendance at Chest Clinics associated with Hospital under supervision of the Consultant. Minor thoracic procedures are carried out and the staff closely associated with the neighbouring major Thoracic Surgical Unit. Remuneration according to status. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 10th September, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LEICESTER ROYAL INFIRMARY. Applications are invited for the posts of HOUSE SURGEON (2) available for pre-registration candidates vacant 1st October. Recognised for F.R.C.S.

Applications, stating age, and qualifications, together with copies of recent testimonials, to the Group Secretary, No. 1 Hospital Management Committee, The Leicester Royal Infirmary, forthwith.

LEICESTER ROYAL INFIRMARY. Applications are invited for the posts of SENIOR HOUSE OFFICER (pathology) (2) vacant 1st October. The posts are recognised for D.Path. and D.C.P.

Applications, stating age, qualifications, and experience, together with copies of recent testimonials, to the Group Secretary, No. 1 Hospital Management Committee, The Leicester Royal Infirmary, forthwith.

LEICESTER GENERAL HOSPITAL. (454 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT MEDICAL REGISTRAR required. The post is interchangeable with a similar one at the Leicester Royal Infirmary, 1 year being spent at each Hospital.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 10th September, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LEICESTER ISOLATION HOSPITAL AND CHEST UNIT, Groby-road, LEICESTER. (328 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (chest and infectious diseases) required. Single accommodation available. This Hospital is also a Thoracic Surgical Centre. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 10th September, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LEEDS REGIONAL HOSPITAL BOARD. Short-term LOCUM TENENS appointments in the Registrar grade are constantly available at hospitals in the area of the Board, particularly in the specialties of anæsthetics, general medicine, general and orthopædic surgery, and psychiatry.

Interested practitioners, suitably experienced, should communicate with the Secretary, Joint Registrars Committee, Park-parade, Harrogate.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Anæsthetics

Halifax Group (approximately 290 Beds in the surgical specialties). Resident.

General Surgery

(*a*) Hull Royal Infirmary (80 general surgical beds) and other hospitals in the Hull A Group. Non-resident. Includes additional duties in the Casualty Department.

(*b*) Halifax Group. Mainly at the Royal Halifax Infirmary (110 general surgical beds). Preferably resident. Includes some duties in the Casualty Department.

Ophthalmology

Halifax and Bradford A Groups equally divided between Halifax Group (11 eye beds—1800 new outpatients annually) and Bradford A Group (34 eye beds—5800 new outpatients annually).

Orthopædic Surgery

St. James's Hospital, Leeds (64 orthopædic beds), and the Public Dispensary, Leeds. Non-resident.

Applications, stating age, qualifications and details of present and previous appointments showing dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 7th September, 1956.

LEEDS REGIONAL HOSPITAL BOARD. Senior Regis-TRAR vacancies.

Chest Diseases

Castle Hill Sanatorium, Cottingham, near Hull. (220 medica and 51 thoracic surgical beds.) Non-resident.

Child Psychiatry

Leeds University Department of Psychiatry and Associated Clinics.

Psychiatry

Scalebor Park Hospital, Burley-in-Wharfedale, near Leeds (300 Beds). 350–400 cases admitted each year to free, amenity and private beds. It is anticipated that the successful candidate will undertake 2 clinical sessions (which may include research) in association with the Department of Psychiatry of the University of Leeds. Candidates must hold the D.P.M. or equivalent qualifications.

Applications, stating age, qualifications, details of present and previous appointments with dates, together with names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 21st September, 1956.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. Applications are invited for the post of SENIOR REGISTRAR in General Medicine, for 1 year in the first instance. The successful candidate may be required to serve a subsequent period in 1 of the Regional Hospitals. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, and 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds, 2.

LIVERPOOL, 20. BOOTLE HOSPITAL. Applications are invited for a post as CASUALTY OFFICER (Junior Hospital Medical Officer grade) at this busy Hospital. The post will be vacant from 1st October, 1956.

Apply to Secretary, Walton Hospital, Liverpool, 9, giving details of experience, qualifications, age, date of registration, and names of 2 referees.

MANCHESTER REGIONAL HOSPITAL BOARD. BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT REGISTRAR (obstetrics/gynæcology) required 14th November, 1956. Post recognised for M.R.C.O.G. Based on Queen's Park Hospital, Blackburn (a general hospital with 58 obstetric beds, mostly abnormal, and 29 gynæcology beds) with duties at Blackburn Royal Infirmary and Accrington Victoria Hospital.

Application forms available from, and returnable to, the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

MANCHESTER REGIONAL HOSPITAL BOARD. Bury AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for REGISTRAR in Surgery at Bury General Hospital, the post falling vacant at the end of August. Post recognised for F.R.C.S.

Applications, together with the names of 2 referees, should be sent to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of Whole-time RESIDENT SURGICAL REGISTRAR to the West Manchester Hospital Management Committee with duties primarily at Park Hospital, Davyhulme, but with duties at other hospitals within the Group. Post vacant early September. 12 months appointment subject to renewal.

Form from Secretary, Park Hospital, Davyhulme.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for a resident post of REGISTRAR in the Obstetrics and Gynæcology Department in the Barrow and Furness Group of hospitals. The post will be available about 1st November next. 72 obstetric/gynæcological beds in main unit; Outpatient Departments and extensive surgical experience. Recognised for D.Obst.R.C.O.G.

Applications to Group Secretary, Barrow and Furness Hospital Management Committee, 105, Abbey-road, Barrow-in-Furness, not later than 6th September, 1956.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Orthopædic Surgery, to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool. Furnished flat in married quarters available. Post vacant from 8th October, 1956.

Applications, together with names and addresses of 2 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The Board invite applications from registered practitioners for the post of ANÆSTHETIC REGISTRAR with duties in the South Manchester Group. The post is recognised by the Royal College of Surgeons for the F.F.A.R.C.S. and for the D.A.

Applications, stating age, qualifications, present post, experience, and names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) Applications are invited for the pre-registration post of JUNIOR HOUSE OFFICER (surgical). Post vacant October.

Applications to Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of OBSTETRICAL HOUSE SURGEON to a maternity unit operating temporarily in the Whitworth Park Branch of the above-named Hospital, vacant shortly. The post is supernumerary to the establishment recognised for training purposes by the Royal College of Obstetricians and Gynæcologists. Previous obstetrical experience is desirable. An opportunity exists for a limited amount of gynæcological training during tenure of the post. National scale.

Application forms, which may be obtained from the undersigned, to be returned no later than 15th September, 1956.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. WYTHENSHAWE HOSPITAL. MANCHESTER REGIONAL HOSPITAL BOARD. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for 2 posts of RESIDENT SURGICAL OFFICER (Registrar grade) at the above Hospital. Each post will include responsibility for general surgical beds and 1 post will include responsibility for gynæcological beds. Both posts are recognised by the Royal College of Surgeons.

Applications, stating age, qualifications, present post, and names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, within 7 days of the appearance of this advertisement.

MARGATE. GENERAL HOSPITAL. (132 Beds.) Senior HOUSE OFFICER (surgical). Recognised for F.R.C.S. and D.A. Salary £745 p.a., less charge for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the Ophthalmic Department of the above Hospital. The Hospital is recognised by the Examining Board for the F.R.C.S. and D.O. Salary £745 a year, less £150 a year for residential emoluments.

Applications should be forwarded as soon as possible to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Church-street, Maidstone.

MAIDSTONE. PRESTON HALL HOSPITAL, British LEGION VILLAGE, MAIDSTONE, KENT. Applications are invited for the appointment of SENIOR HOUSE OFFICER. Salary £745 p.a., national scale and conditions. The Sanatorium contains 330 Beds for the treatment of tuberculosis and includes a Major Thoracic Surgical Unit. Candidates may visit the Hospital at any time.

Applications, stating age, qualifications and giving names of 2 referees, to be sent, not later than 15th September, 1956, to—

A. A. HOWICK, Group Secretary.

MUSSELBURGH, MIDLOTHIAN. EDENHALL HOS-PITAL. (221 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER (general surgical) vacancy 1st October, 1956.

Applications, stating age, experience and copies of recent testimonials, to the Medical Superintendent.

NEWCASTLE GENERAL HOSPITAL. Newcastle upon TYNE HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN to the Professorial Psychiatric Unit (54 Beds). This post is recognised for the purpose of Pre-registration Service and preference will be given to provisionally registered persons who have carried out their first House appointment. Post vacant 2nd October, 1956. The Unit is under the clinical direction of the Department of Psychological Medicine, King's College, Medical School, University of Durham. The Hospital is recognised for the purpose of study for the Diploma in Psychological Medicine.

Applications, together with the names and addresses of 2 referees, should be sent within 10 days of the appearance of this advertisement to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4.

NEWCASTLE GENERAL HOSPITAL. Newcastle upon TYNE HOSPITAL MANAGEMENT COMMITTEE. DEPARTMENT OF OBSTETRICS. (70 Beds.) The resident post of OBSTETRICAL HOUSE SURGEON becomes vacant on 1st November, 1956. This post is recognised for the purposes of Pre-registration Service and preference will be given to provisionally registered persons who have served 6 months in a medical or surgical post since qualification. The department is recognised for the Diploma of M.R.C.O.G. and D.Obst. R.C.O.G., and undertakes the training of Medical Students in the University of Durham.

Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, with the names and addresses of 2 referees.

NEWCASTLE REGIONAL HOSPITAL BOARD. Cherry KNOWLE HOSPITAL, RYHOPE, near SUNDERLAND. REGISTRAR PSYCHIATRIST (whole-time), resident or non-resident. Small flat available. Arrangements can be made for appointee to take necessary courses of study for the University of Durham Diploma in Psychological Medicine.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD.

Hemlington Hospital, Middlesbrough (55 plastic surgical beds)

REGISTRAR in Plastic Surgery Unit (whole-time). Duties also to be undertaken at Stockton Children's Hospital. Single accommodation may be available.

Newcastle General Hospital (800 Beds)

REGISTRAR ANÆSTHETIST (whole-time). Single accommodation may be available.

REGISTRAR PÆDIATRICIAN (resident), whole-time, in Children's Department, also duties at the Hospital for Sick Children; closely associated with University Department of Child Health. Person appointed to take part in teaching.

Tees-side Hospital Management Committee

REGISTRAR OBSTETRICIAN AND GYNÆCOLOGIST (whole-time). Single accommodation available. Post affords good obstetrical and gynæcological experience.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time non-resident appointment of REGISTRAR in the Department of Dermatology at the Royal Victoria Infirmary. The appointment is for 1 year in the first instance and is subject to the terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time non-resident appointment of REGISTRAR to the Department of Psychological Medicine at the Royal Victoria Infirmary. The successful candidate will work under the direction of the Head of the Department and will be expected to undertake some teaching in his subject. The appointment is for 1 year in the first instance and will be subject to Ministry of Health terms and conditions of service for hospital medical and dental staffs.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NORTHAMPTON GENERAL HOSPITAL. (482 Beds.) Vacancies 1st October, 1956, for the following:—

HOUSE OFFICER (general surgery); recognised for F.R.C.S.

HOUSE OFFICER (Department of Anæsthetics); recognised for D.A.

HOUSE OFFICER (Pædiatric Department); recognised for D.C.H.

HOUSE OFFICER (Fracture and Orthopædic Department); recognised for F.R.C.S.

HOUSE OFFICER (Casualty Department); recognised for F.R.C.S.

SENIOR HOUSE OFFICER (Casualty Department); recognised for F.R.C.S.

SENIOR HOUSE OFFICER (E.N.T. Department); recognised for F.R.C.S. and D.L.O.

SENIOR HOUSE OFFICER (Department of Pathology).

All posts, except those of Anæsthetic House Officer and the Senior House Officer posts, recognised for pre-registration. Casualty House Officer and Pædiatric House Officer posts recognised for medical pre-registration. All 6 months appointments in first instance.

Applications, enclosing copies of 3 testimonials, as soon as possible, to S. G. HILL, Superintendent.

NEWMARKET GENERAL HOSPITAL, Suffolk. Applications are invited for the post, now vacant, of SENIOR HOUSE OFFICER, for orthopædic and casualty duties. The post is resident.

Applications, giving age, nationality and qualifications, together with 3 recent testimonials, should be sent to the Medical Superintendent.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (casualty) duties to commence on or about 7th September, 1956. Establishment 3. Recognised for F.R.C.S. Post offers wide experience of casualty work.

Applications, stating age, nationality, qualifications and experience, together with copies of testimonials, to be sent to the Secretary, General Hospital, Nottingham.

NOTTINGHAM. HIGHBURY HOSPITAL. Senior HOUSE OFFICER (surgical) required at the above Hospital. Good opportunity for obtaining experience in all types of general surgery. Duties to commence on or about 16th September, 1956.

Applications, stating age, qualifications and experience, and nationality, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Pædiatrics to the hospitals of the Northampton and Kettering area with duties mainly at Northampton General Hospital. Applicants holding or wishing to take the D.C.H. preferred. Post provides general experience in pædiatrics and includes specific fevers and neo-natal work. The appointment will be for 1 year and eligible for extension to 2 years.

Applications on forms obtainable from the Secretary, Registrars Committee, 43, Banbury-road, Oxford, should reach him by 14th September, 1956.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for the post of NON-RESIDENT REGISTRAR in the Department of Pathology, Radcliffe Infirmary, from 19th October, 1956.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 10th September, 1956.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for the post of HOUSE SURGEON in the Thoracic Surgery Unit at the Churchill Hospital, to commence as early as possible until 31st January, 1957.

Applications, stating age, qualifications and experience, together with names of 2 referees, to Administrative Assistant, Radcliffe Infirmary, Oxford, as soon as possible.

PLYMOUTH. THE SCOTT ISOLATION HOSPITAL. PLYMOUTH SPECIAL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER from Male registered medical practitioners who have preferably been qualified for 1 year and have had previous hospital experience. The applicant should be able to drive a car. The duties, in 2 departments, will be chiefly in connection with infectious and venereal diseases, the former including a substantial proportion of cases in children. The varied clinical work, including acute medical cases and early pulmonary tuberculosis, provides valuable experience, particularly to those reading for a higher medical degree. The appointment will be for 1 year, vacant on 1st October next.

Applications, together with copies of 2 recent testimonials, should be sent to the Group Secretary, Plymouth Special Hospital Management Committee, 8, Nelson-gardens, Stoke, Plymouth, immediately.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Queen Alexandra Hospital

SENIOR HOUSE SURGEON (87 surgical beds), vacant 1st September, 1956.

Royal Portsmouth Hospital

SENIOR HOUSE SURGEON (70 surgical beds), vacant 19th September, 1956.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

35, Grove-road South, Southsea.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER in the Area Department of Diseases of the Chest, for duty in the Reading Chest Clinic. The post offers wide experience in both tuberculous and non-tuberculous chest diseases and duties will include attendance at Prospect Park Hospital, Reading, and Peppard Chest Hospital, Henley. Facilities are available for postgraduate studies. Salary within the scale £775–£1075 p.a.

Applications, stating age and qualifications, together with names of 3 referees, should be sent to the Group Secretary, 3, Craven-road, Reading.

READING. BATTLE HOSPITAL. (391 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON in the Area Accident and Orthopædic Department. Post vacant 1st October next. F.R.C.S. recognised. Also casualty duties. Salary £425–£525 p.a., less £125 board-residence.

Apply, stating age, qualifications with dates, nationality, present post, with 1 copy of recent testimonial, to Hospital Secretary.

READING COMBINED HOSPITALS. Area Department OF OBSTETRICS AND GYNÆCOLOGY. (104 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the resident appointment of GYNÆCOLOGICAL HOUSE SURGEON at the Royal Berkshire Hospital, Reading. Vacant 1st October and tenable for 6 months. Post recognised for M.R.C.O.G.

Write, stating age and qualifications with dates, nationality, and present appointment, with copy of 1 recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (399 Beds.) READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered and provisionally registered medical practitioners for the resident post of HOUSE PHYSICIAN in the Pædiatric Department; vacant 15th September for 6 months.

Write, before 3rd September, stating age, qualifications with dates, nationality, present post, with 1 copy of recent testimonial, to Secretary.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL. RESIDENT HOUSE SURGEON (pre-registration appointment), vacant late September.

Apply Hospital Secretary, quoting 2 referees.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE PHYSICIAN (Male) required early in September, 1956. Post not approved for pre-registration purposes.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

STOCKTON-ON-TEES. SEDGEFIELD GENERAL HOSPITAL, SEDGEFIELD. (336 Beds.) SEDGEFIELD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER ANÆSTHETIST urgently required. Full Consultant staff employed, and the post, which offers excellent facilities for anæsthetic training, is recognised in connection with the examinations for the higher qualifications.

Applications, together with copies of 2 recent testimonials or names of 2 referees, to the undersigned as soon as possible.

L. WATSON, Group Secretary.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. PSYCHIATRIC UNIT, MARYFIELD GENERAL HOSPITAL AND DUNDEE ROYAL MENTAL HOSPITAL. Applications are invited for the post of SENIOR REGISTRAR. These active units (including a new E.E.G. Department) and their associated Outpatient Department are principally concerned with the treatment of neuroses and early psychoses and provide a comprehensive training in psychiatry. Candidates, in addition to psychiatric experience, must possess up-to-date knowledge of internal medicine. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary of the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 15th September, 1956.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. ASHLUDIE HOSPITAL, MONIFIETH, DUNDEE. Thoracic surgery. Applications are invited for the appointment of SENIOR REGISTRAR in Thoracic Surgery at Ashludie Hospital, Monifieth, near Dundee (222 Beds), which contains the Regional Thoracic Surgical Unit of 66 Beds for tuberculous and non-tuberculous cases. Higher surgical qualification and previous experience in thoracic surgery essential; additional experience in general or chest medicine an advantage. Salary and conditions of service in accordance with national agreement.

Forms of application and further particulars from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 15th September, 1956.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance:—

2 REGISTRARS in Surgery based at Stobhill General Hospital, Glasgow.

REGISTRAR in E.N.T. Surgery based at the Royal Infirmary, Glasgow, for duties at Law Hospital, Carluke.

REGISTRAR in Psychiatry based at Hawkhead Mental Hospital, Glasgow.

REGISTRAR in Psychiatry based at Riccartsbar Mental Hospital, Paisley.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 15th September, 1956.

SCUNTHORPE. WAR MEMORIAL HOSPITAL. (262 Beds.) Applications are invited for RESIDENT HOUSE PHYSICIANS.

(*a*) Senior House Officer/Intern, vacant late September.

(*b*) Intern/Senior House Officer, vacant early October.

Busy department with medicine, pædiatrics, skins and eyes—large outpatient clinics.

Applications, naming 2 referees, to Group Secretary, Scunthorpe Hospital Management Committee.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRAR in Psychiatry required for Middlewood Hospital, Sheffield (2098 Beds). A flat (2 bedrooms) is available. D.P.M. essential. Appointment for 1 year in the first instance, reviewable annually. Opportunity for research and experience in the special branches of psychiatry available in the Hospital area.

Application forms and further details obtained from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 17th September, 1956.

SHEFFIELD REGIONAL HOSPITAL BOARD. Sheffield NATIONAL CENTRE FOR RADIOTHERAPY. Whole-time NON-RESIDENT SENIOR REGISTRAR required. Candidates should possess the Diploma in Radiotherapy or a higher qualification in medicine or surgery. Duties mainly in Sheffield but there may be occasional duties at associated centres in the region. Appointment for 1 year in first instance reviewable annually.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 17th September, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS/ SHEFFIELD REGIONAL HOSPITAL BOARD. SHEFFIELD CENTRE FOR THE INVESTIGATION AND TREATMENT OF RHEUMATIC DISEASES. REGISTRAR required at the above Centre which has an outpatient, an inpatient, and a Chemical Research Unit. A Registrar is required to assist in the study and treatment of severe rheumatic diseases. Previous experience in this field is not essential but candidates must have an interest in research.

Applications immediately, with the names of 3 referees, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1, from whom further details may be obtained.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL INFIRMARY UNIT. Applications are invited for the following posts at the above Hospital :—

(*a*) NON-RESIDENT REGISTRAR in Neurosurgery. Closing date for applications 30th September, 1956.

(*b*) RESIDENT SENIOR HOUSE OFFICER in Clinical Pathology. Post vacant 3rd October, 1956. Pathological experience not essential. The successful candidate will work in turn in the different branches of clinical pathology in the laboratories of The United Sheffield Hospitals.

Applications for the above posts should give the names of 3 referees and be sent to :—

For post (*a*) : The Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

For post (*b*) : The Superintendent, Royal Infirmary, Sheffield, 6.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum HOUSE OFFICER (casualty) required. Experience provided in orthopædics and plastic cases.

Applications, stating age and qualifications, with names of 2 referees, to Secretary.

SOUTHAMPTON CHILDREN'S HOSPITAL. (Recognised by Conjoint Board for D.C.H.) HOUSE OFFICER required. Post vacant 8th October, 1956. Total establishment of 3 residents. Salary, &c., as nationally advocated.

Applications, with copies of testimonials, to be submitted by 8th September to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post recognised for Pre-registration Service and tenable for 6 months. The Hospital is the centre to which all trauma from a large industrial town and port is directed thus providing excellent experience in the treatment of traumatic conditions ; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (274 Beds) and SOUTHAMPTON GENERAL HOSPITAL (472 Beds). SENIOR HOUSE OFFICER (E.N.T.) required beginning of October. This post is recognised for the F.R.C.S (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work. The Group includes a diagnostic and distributing Hearing Aid Centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTH CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics). 6 months or 12 months as preferred. Approved for D.A. Duties chiefly at general hospital and maternity unit. Salary and conditions as per regulations.

Applications, stating age, details of experience, qualifications and names of 3 referees, immediately, to Group Secretary, Group Headquarters, Barony Hospital, Nantwich, Cheshire.

SOUTH CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. CREWE AND DISTRICT MEMORIAL HOSPITAL. (108 Beds and Annexe 34 Beds—Acute.)

Pre-registration HOUSE OFFICER (surgical) required at the above Hospital (approved for F.R.C.S.). Normally tenable for 6 months. Salary £425–£525, less £125 for residential emoluments.

Apply, stating age, qualifications, experience, with names of 2 referees, to Group Secretary, Barony Hospital, Nantwich, Cheshire.

Locum REGISTRAR (surgical) required at the above Hospital (approved for F.R.C.S.) for the month of October.

Applications, with full details, immediately, to the Group Secretary, Group Headquarters, Barony Hospital, Nantwich, Cheshire.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time ORTHOPÆDIC REGISTRAR with opportunity for general surgical work, in the Orpington and Sevenoaks Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 15th September, 1956.

SOUTH EAST NORTHUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (Tuberculosis Service) required for duties at the Moor Park and Hadrian Hospitals. Junior Hospital Medical Officer or Senior House Officer grade according to experience.

Applications, with names of 2 referees, to Group Secretary, Preston Hospital, North Shields, as soon as possible.

SOUTHEND. GENERAL HOSPITAL. Applications are invited for the appointment of SENIOR HOUSE OFFICER to the Orthopædic and Fracture Department. Post vacant 15th September, 1956. The Orthopædic and Fracture Department of this Hospital is the centre for reference of all cases from a large surrounding area and the post offers excellent experience in all aspects of orthopædic and traumatic surgery under the supervision of and with instructions from the Consultant-in-charge. Post recognised for the F.R.C.S.

Applications, stating age, qualifications, and experience, together with copies of recent testimonials, to be sent to the undersigned by 7th September, 1956.

J. C. FIELD, Secretary.

SOUTHEND-ON-SEA HOSPITAL. Temporary Orthopædic REGISTRAR required full-time for duty at Hospitals in the Southend-on-Sea Group, with appropriate responsibilities in the Casualty Department at the General Hospital, Southend. The appointment is on a month to month basis, but is expected to continue for several months. Post vacant 17th September, 1956.

Applications, accompanied by copies of recent testimonials, to be sent to the undersigned at the General Hospital, Southend-on-Sea, by 7th September, 1956. J. C. FIELD, Secretary.

SOUTHPORT GENERAL INFIRMARY. Junior HOSPITAL MEDICAL OFFICER (resident). Whole-time casualty post, vacant about November.

Apply, stating age, qualifications, experience, nationality, enclosing copies of 2 recent testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SOUTHPORT. PROMENADE HOSPITAL. Senior HOUSE OFFICER (resident). Duties mainly connected with Orthopædic and E.N.T. Departments. Post vacant about mid-September.

Apply, stating age, experience, qualifications, nationality, and enclosing copies of 2 recent testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SALFORD ROYAL HOSPITAL. (257 Beds—general.) SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (medicine). Appointment for 1 year, vacant October. Salary subject to a deduction of £150 p.a. for board and lodging.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Salford Royal Hospital, Chapel-street, Salford, 3.

SKIPTON (near). GRASSINGTON HOSPITAL. (208 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required for the above Hospital, which provides treatment for tuberculosis patients, men and women. Accommodation available for single applicants. Post tenable from 1st September, 1956.

Applications to Medical Superintendent.

STAFFORD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics), Male or Female, resident. Recognised for D.A.

Applications to Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) SENIOR HOUSE OFFICER (ophthalmology) required. Recognised F.R.C.S. and D.O.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) Locum Tenens ANÆSTHETIC REGISTRAR (resident), required for the period 10th–23rd September, inclusive.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL, Normandy-road, St. ALBANS. (384 Beds.) Locum Tenens SURGICAL REGISTRAR required for 1 of the 2 general surgical teams for the period 10th–30th September, inclusive.

Applications to the Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS, HERTFORDSHIRE. CELL BARNES HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required at above Hospital. This is a modern hospital where 895 mentally defective persons of all types, including children, are under care. Approved for D.P.M. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Hospital Management Committee, Harperbury Hospital, St. Albans, Herts, by 10th September, 1956.

SUNDERLAND. ROYAL INFIRMARY. (300 Beds.) HOUSE OFFICER (Male) required for duties in Gynæcological and Urological Units. Post vacant 26th September, 1956. Provisionally registered practitioners may apply.

Applications, naming 2 referees, to the Hospital Secretary, Royal Infirmary, Sunderland.

SUTTON AND CHEAM HOSPITAL, Cotswold-road, SUTTON, SURREY. RESIDENT SENIOR HOUSE OFFICER (Casualty Officer), vacant 7th September. Post recognised for F.R.C.S.

Applications, stating age, experience and qualifications, with copies of recent testimonials and the names of 2 referees, to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

TORQUAY. TORBAY HOSPITAL. Resident Senior HOUSE OFFICER (surgery) required early September, 1956. Post recognised for F.R.C.S. There is a complement of 6 Resident House Officers.

Applications, stating qualifications, age, nationality, with copies of testimonials (quoting Ref. F. 955/72) to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. Applications invited for post of HOUSE PHYSICIAN to the Special Unit for research in Juvenile Rheumatism, vacant 6th October. Post offers scope for those interested in research, pædiatrics, rheumatology, or cardiology.

Applications, stating age, qualifications and experience, with copies of 2 testimonials, to Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN required for post vacant 12th October. Preference given to persons seeking pre-registration post.

Applications, stating age, experience, and qualifications with dates, with copies of 2 testimonials, to Secretary.

VIRGINIA WATER, SURREY. HOLLOWAY SANATORIUM. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time appointment of PSYCHIATRIC REGISTRAR. Full facilities are available for training. An unfurnished flat is available for a married man.

Application forms are available from the Group Secretary and returnable within 14 days of the date of this advertisement. Inspection of the Hospital is invited by direct arrangement with the Physician-Superintendent.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. RESIDENT SURGICAL OFFICER (Senior House Officer grade) required from 1st November, 1956. Salary £745 p.a. A charge of £150 p.a. will be made for accommodation.

Address written applications, giving full personal particulars and details of experience, &c., to W. BOWRING, Group Secretary. Victoria Chambers, Wood-street, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Locum Tenens RESIDENT SURGICAL OFFICER (Senior House Officer grade) required from 1st September, 1956. Salary £14 10s. per week. A charge at the rate of £150 p.a. will be made for accommodation.

Address written applications, giving full personal particulars and details of experience, &c., to W. BOWRING, Group Secretary. Victoria Chambers, Wood-street, Wakefield.,

WALLINGFORD (near), BERKSHIRE. FAIR MILE HOSPITAL. BERKSHIRE MENTAL HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER at above Mental Hospital of 1053 Beds. The post provides an excellent opportunity for postgraduate training in psychiatry, including outpatient clinic work and every facility is provided for study for the D.P.M. Single residential accommodation is available. The appointment is subject to the terms and conditions of service for hospital medical staff, the salary scale being £775–£50–£1075 p.a.

Applications, including details of age, qualifications and experience, together with the names of 2 referees, should be forwarded to the Medical Superintendent, Fair Mile Hospital, near Wallingford, Berks., within 10 days of the appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Registrar in Thoracic Medicine, Llangwyfan Hospital, near Denbigh. Modern methods of treatment of tuberculosis. 370 adult beds (male and female) and children. Hospital also contains major Thoracic Unit. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WEST BROMWICH AND DISTRICT GENERAL HOSPITAL. (144 Beds.) HOUSE PHYSICIAN (pre-registration), vacant 1st October, 1956.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WEST BROMWICH AND DISTRICT GENERAL HOSPITAL. (144 Beds.) HOUSE SURGEON (pre-registration), vacant 1st October, 1956.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WEST BROMWICH AND DISTRICT HOSPITALS. GROUP NO. 18. JUNIOR HOSPITAL MEDICAL OFFICER (pædiatrics) required immediately. Whole-time. Duties at West Bromwich and District General Hospital and Hallam Hospital. Initially the tenure of the post is for 4 years. Salary scale £775–£50–£1075 p.a.

Applications, with names of 3 referees, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich, by 22nd September, 1956.

WORCESTER. RONKSWOOD HOSPITAL. Resident ANÆSTHETIST (Senior House Officer status) required at end of September for post which is recognised by the Faculty of Anæsthetists. Duties cover all specialties. Married accommodation available.

Applications, with names and addresses of 3 referees, to be sent to the Hospital Secretary.

WORCESTER ROYAL INFIRMARY. House Physician (pre-registration or otherwise) required.

Applications to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the University of Birmingham Medical School.) 1 HOUSE OFFICER (Locum), General Surgery. 15th–29th September. Also listed as pre-registration post.

Apply Secretary, with copies of testimonials.

WOODFORD GREEN, ESSEX. HARTS HOSPITAL. (100 Beds.) SENIOR HOUSE OFFICER required. Post vacant 4th October, 1956. The Hospital is a modern sanatorium with a Thoracic Surgical Unit and Area Chest Clinic. The post offers exceptional opportunity for gaining experience in tuberculosis and diseases of the chest. Accommodation for single person only. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WICKFORD (near), ESSEX. RUNWELL HOSPITAL. (1032 Beds.) SENIOR HOUSE OFFICER (Male or Female) required for 1 of the Consultants Divisions and to assist in outpatient work. Excellent postgraduate facilities for D.P.M. Salary £745, residential charge £150.

Applications, with copies of testimonials, to the Secretary.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR in Chest Diseases to the Wigan and Leigh and Wrightington Groups of hospitals. 2 busy chest clinics and opportunity to gain experience in Thoracic Surgical Unit.

Applications, together with the names of 2 referees, to the Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan, as soon as possible.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (313 Beds.) HOUSE OFFICER (anæsthetics). Post vacant 10th October. The Hospital is recognised for the F.F.A.R.C.S. and D.A.

Applications, with copies of 2 testimonials, to the Group Secretary.

WESTON-SUPER-MARE GENERAL HOSPITAL. Resident Locum Tenens CASUALTY OFFICER (Senior House Officer grade) required at the above Hospital for the period 1st–14th October, 1956, inclusive.

Applications should be addressed to the Group Secretary, Weston-super-Mare Hospital Management Committee, c/o The Convalescent Hospital, Uphill-road, Weston-super-Mare.

WEYMOUTH AND DISTRICT HOSPITAL. (124 Beds.) HOUSE PHYSICIAN (Male or Female) required for resident, pre-registration post; vacant end September and tenable for 6 months.

Applications, stating age, qualifications, and nationality, together with 2 copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset, immediately.

YORK. COUNTY, CITY AND YEARSLEY BRIDGE HOSPITALS. Locum Tenens SENIOR HOUSE OFFICER in Pædiatrics and Infectious Diseases required 17th–30th September, 1956.

Applications, giving age, nationality, qualifications and names of 2 referees, to Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York, immediately.

B.W.I. UNIVERSITY COLLEGE HOSPITAL OF THE WEST INDIES. Applications are invited for the following post-registration appointments at the above-named Teaching Hospital of 301 Beds approved by the University of London for its degrees:—

(1) 2 SENIOR CASUALTY OFFICERS for Medical and Surgical Casualty Departments. Applicants should have been qualified for a minimum of 2 years. Appointments are for 6 months commencing 1st January and 1st July, 1957, and salary is payable at the rate of £850 p.a., less a deduction of £145 p.a. in respect of single accommodation and board.

(2) MEDICAL CASUALTY OFFICER from 1st January and 1st July, 1957.

(3) SURGICAL CASUALTY OFFICER from 1st July, 1957.

(4 RESIDENT ANÆSTHETIST from 1st July, 1957.

(5) 2 RELIEVING (Rotating) HOUSE OFFICERS from 1st January and 1st July, 1957.

(6) Required immediately: SURGICAL CASUALTY OFFICER and 2 HOUSE OFFICERS for relieving duties in different departments—the appointments to be continuous with the above posts.

Salaries for these posts are payable at the rate of £750 p.a., less a deduction of £145 p.a. for single accommodation and board.

Return first-class passages paid for 1 person only in respect of each contract. Contracts will extend for 12 months, and consist of 2 posts of 6 months each for candidates appointed from outside Jamaica.

Further information may be obtained from the Hospital Manager and Secretary, University College Hospital, Mona P.O. Jamaica, B.W.I., to whom applications stating age, nationality, details of qualifications, and experience, together with 3 recent testimonials or the names and addresses of 3 referees, and stating posts preferred in order of preference, should be sent immediately.

MULLINGAR. COUNTY HOSPITAL. Resident Medical OFFICER required at above Hospital for a period of 6 months, subject to extension. Salary: First 6 months £325 p.a.; second 6 months £375 p.a.; third 6 months £425 p.a.; fourth 6 months £475 p.a. A temporary bonus at the rate of 10% on the first £300 and 6½% on the portion of salary over £300 is at present payable less a deduction of £9 p.a. towards the cost of rations and apartments which are provided. Credit will be given for previous service in a recognised hospital.

Applications must reach the County Secretary, Westmeath County Council, County Buildings, Mullingar, not later than Monday, 10th September, 1956.

Public Appointments

WEST LOTHIAN. COUNTY COUNCIL OF THE COUNTY OF WEST LOTHIAN. Applications are invited for the appointment of ASSISTANT MEDICAL OFFICER OF HEALTH from registered medical practitioners holding the D.P.H. Preference will be given to candidates who have held a house appointment in a maternity hospital. Every opportunity will be given to the successful applicant to obtain experience in all aspects of Local Health Authority work. Salary scale £1050–£50 (3)–£1200–£55 (5)–£1475, with placing according to experience. The post is superannuable. Possession of a car, for which an allowance will be provided, is essential.

Applications, giving full details of age, qualifications and experience, together with the names of 3 referees, to be lodged with the undersigned not later than 15th September, 1956.

JOHN CALDER, County Clerk.

County Buildings, Linlithgow, 23rd August, 1956.

BOROUGH OF HOVE, Senior Assistant Medical Officer ; EAST SUSSEX COUNTY COUNCIL, SCHOOL MEDICAL OFFICER. Applications are invited for the above permanent appointments from Male registered medical practitioners possessing the D.P.H. The combined salary scale is £1155 p.a., rising by 3 annual increments of £50 and 5 of £55 to £1580 p.a. Account will be taken of previous experience in fixing the commencing salary. Car allowances are paid. The duties include work in connection with Public Health, Infectious Diseases, and School Medical Services.

Further particulars and application forms may be obtained from the undersigned, to whom applications should be sent so as to arrive not later than Monday, 10th September, 1956.

Town Hall, Hove, 3. JOHN E. STEVENS, Town Clerk.

GLAMORGAN EDUCATION AUTHORITY. Borough OF RHONDDA. COMMITTEE FOR EDUCATION. Applications are invited from registered medical practitioners for appointment as ASSISTANT MEDICAL OFFICER, under the supervision of the District School Medical Officer at a salary of £1050–£50–£1200–£55–£1475 p.a. Preference will be given to candidates holding the D.P.H. or D.C.H. and experience in paediatrics will be an advantage. The appointment is superannuable and the successful candidate will be required to pass an examination as to physical fitness.

Forms of application and conditions of appointment may be obtained from the District School Medical Officer, Tydfil House, Pentre, Rhondda, by whom completed applications should be received as soon as possible. D. J. JONES, Town Clerk.

STAFFORDSHIRE COUNTY COUNCIL. Wednesbury MUNICIPAL BOROUGH COUNCIL. Applications are invited for the separate part-time appointments of MEDICAL OFFICER to the Wednesbury Area Health Committee of the County Council and MEDICAL OFFICER OF HEALTH of the Borough of Wednesbury. The appointments together will constitute whole-time, the allocations being 6 half-days and 5 half-days respectively. The proportionate salary for each appointment is calculated in accordance with the latest agreed scale, and increments will be given for previous service in the same capacity, the ranges being :—

Medical Officer to Area Health Committee (County Council) £1018 5s. 11d.–£36 5s. 0d. (7)–£32 19s. 1d. (1)–£1305.

Medical Officer of Health (Wednesbury M.B.C.) £836 7s. 3d.–£25–£936 7s. 3d.

A car is necessary and an allowance will be paid.

The posts are superannuable and the successful candidate must pass a medical examination and produce his birth certificate. Applicants must be fully qualified medical practitioners with experience in public health duties, and must hold the Diploma of Public Health or its equivalent. The candidate appointed will, as regards the County Council duties, act under the direction of the County Medical Officer of Health and will be required to perform such duties as may from time to time be prescribed. As regards the duties of Borough Medical Officer of Health, he will be subject to the Sanitary Officers (outside London) Regulations, 1935 and 1951, and to the sole control and direction of the Corporation. Either appointment will be subject to 3 calendar months notice in writing on either side.

Forms of application may be obtained from the County Medical Officer of Health, County Buildings, Stafford, and should be returned to him not later than by first post on 14th September, 1956. T. H. EVANS, Clerk of the County Council.

G. P. THOMPSON, Town Clerk, Wednesbury M.B.C.

County Buildings, Stafford, 20th August, 1956.

TREASURY MEDICAL SERVICE. Applications are invited from Medical Practitioners, practising in the districts detailed below, for appointment, in a part-time and mainly advisory capacity, as LOCAL TREASURY MEDICAL OFFICER for each of the places or groups of places shown. The town shown in brackets after the place-names indicates the Head Post Office Area in which the place, or group of places, is situated. Successful applicants will be required to examine and report on the condition of certain Government Officers, teachers, candidates for appointment, &c., who may be referred to them from time to time ; and to attend when summoned to an emergency case of accident or sudden illness occurring in a Government office in the neighbourhood. Fees for this work, and mileage allowance where necessary, will be paid on a scale agreed with the British Medical Association.

Intending applicants should write, within 14 days, to Treasury Medical Adviser, Treasury Chambers, Whitehall, S.W.1, for a form on which application may be made. Applicants should be not more than 60 years of age.

The places for which applications are invited are as follows :—

Dulwich (London, S.E.21).
Lower Edmonton (London, N.9).
Upper Edmonton (London, N.18).
Kirkby (Liverpool).

SASKATCHEWAN DEPARTMENT OF PUBLIC HEALTH

CANCER CLINIC
UNIVERSITY HOSPITAL
SASKATOON, SASKATCHEWAN, CANADA

SENIOR CANCER CLINIC ASSOCIATE required for the above Clinic.

Salary $828 per month with automatic annual increases to $994 per month.

Requirements—Certification by the Royal College of Physicians and Surgeons of Canada or its equivalent. Applicant should be an Internist and have considerable experience in investigation and diagnosis of cancer cases.

For application forms or further information write Personnel Officer, Provincial Health Building, Saskatchewan Department of Public Health, Regina, Saskatchewan.

NORFOLK COUNTY COUNCIL. Applications are invited from registered medical practitioners holding the Diploma in Public Health for appointment as SENIOR ASSISTANT MEDICAL OFFICER on headquarters staff. In addition to administrative work, the duties will include the medical examination of staff and deputising for other medical officers. The salary scale (subject to Council approval) will be £1343 10s.–£52 10s.–£1606. Travelling and subsistence allowances will also be paid.

Application forms, together with further particulars of the post, can be obtained from the County Medical Officer, 29, Thorpe-road, Norwich, to whom completed applications should be sent not later than 19th September, 1956.

Hospital Services : Non-Medical Appointments

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE GENERAL HOSPITAL, Steelhouse-lane, BIRMINGHAM, 4. Applications are invited for the post of ASSISTANT BIOCHEMIST (Basic grade). Candidates should hold the Degree of B.Sc. with honours in Chemistry or Biochemistry, or an equivalent qualification. Salary according to Whitley Council scale, with allowances for postgraduate study or experience.

Applications should be sent to the House Governor not later than 3 weeks after the appearance of this notice.

BIRMINGHAM, 15. THE QUEEN ELIZABETH HOSPITAL. BIOCHEMIST (Basic grade) required for the Biochemical Laboratory at above Hospital. Candidates must hold a University degree in Science or the Associateship of the Royal Institute of Chemistry. Salary according to Whitley Council scale with allowances for postgraduate study or experience.

Applications to be sent as soon as possible to House Governor, the Queen Elizabeth Hospital, Edgbaston, Birmingham.

Miscellaneous

Dr. Barnardo's Homes. 2 Women Medical Officers required as follows :—

(*a*) Attached to Headquarters staff. Chief duties visiting and inspection of branch homes and supervision of foster children's medical records.

(*b*) House Officer at the Australasian Hospital and Village Home, Barkingside.

Salary scale £750–£1150. Posts vacant 1st October.

For further details apply to Chief Medical Officer, 18, Stepney-causeway, London, E.1.

Medical Officer required by large Oil Company for service initially based on London but entailing overseas tours of duty and eventually for permanent service in the Middle East. Preference will be given to bachelors under 37 with overseas experience and some knowledge of tropical work. Salary commensurate with qualifications and experience but not less than £1200 p.a. whilst in U.K. Pension scheme.—Apply quoting No. 646, to BOX No. 319, c/o CHARLES BARKER & SONS LTD., Gateway House, London, E.C.4.

An Oil Company in the British West Indies invites applications from young registered medical practitioners for the position of Relief Medical Officer for a tour of 3 years. The successful applicant will be required to do dispensary work and to assist in general duties of the medical department, including standby duty after normal working hours. Candidates should be under 35, with good general experience. Basic salary from £1600 p.a. upwards.—Apply, with brief particulars, to : Address, No. 240 THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Imperial Chemical Industries Limited has a vacancy for a graduate preferably under 30 years of age, trained in bacteriology for investigational work in problems arising out of the use of the Company's pharmaceutical products. The successful candidate, after a short period of training at Blackley, in North Manchester, will be required to work near Wilmslow, Cheshire.

Applications with full particulars should be addressed to the Staff Manager (H), Imperial Chemical (Pharmaceuticals) Limited, Fulshaw Hall, Wilmslow, Cheshire.

C. & J. Clark Limited, Shoe Manufacturers, wish to appoint a Physiologist to carry out investigations into factors covering foot comfort and into the development of techniques whereby such factors may be assessed. The programme of research envisaged is likely to extend over several years, and the post offers considerable scope to a suitably qualified graduate. The salary will depend on experience and qualifications, but will be in the £1000–£1500 region.

Applications, which will be dealt with in strict confidence, should be sent to the Personnel Director, Messrs. C. &. J. Clark Ltd., Street, Somerset.

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Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

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PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, September 1, 1956.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

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6/5